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Canadian Transport Commission
Research Branch

Commission canadienne des transports
Direction de la recherche

North Atlantic Container Shipping Costs Study

WP 20-86-25

Canada

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NORTH ATLANTIC CONTAINER SHIPPING COSTS STUDY

Final Report

Prepared for

CANADIAN TRANSPORT COMMISSION

Research Branch

WP 20-86-25

January 1985

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Commission canadienne des transports
Canadian Transport Commission

FOREWORD

This report forms part of a two-phase study prepared for the Canadian Transport Commission by a marine consultant. The Research Branch engaged the services of Philippe I. Georges and Associates of Montreal to develop a detailed data base related to ocean and port costs for selected North Atlantic routes.

A micro computer program was written using the cost figures developed by the consultant. Working Paper WP 20-86-21 provides one example of the type of analysis that can be carried out by manipulating the cost data in this versatile "model".

Whenever possible, the Commission makes publicly available the results of its research and the present report is offered, in limited quantities, in line with this policy. The text of the study is a reproduction of the final report submitted by the consultant and the opinions expressed are those of the author and do not necessarily reflect the views of the Canadian Transport Commission.

R. W. Lake
Executive Director
Research Branch

December 1986

Canada

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January 1985

Dr. G. Hariton
Executive Director, Research
Canadian Transportation Commission
15 Eddy Street
Hull, Quebec K1A 0N9

Dear Dr. Hariton:

I have pleasure in submitting the final report on the "North Atlantic Container Shipping Costs Study".

The report documents in detail identifiable elements of ships operating costs on the Canada-North Europe Container trade.

The study examined and described all the relevant elements and factors that impact on costs and operations of a hypothetical container ship. This includes identifying and defining the following:

> Vessel characteristics and requirements, newbuilding costs of container liners, financing costs, cost of container equipment, types of containers and number of sets required per vessel, crew wages and manning requirements, fuel consumption, insurance, port and cargo expenses, cargo handling.

The study developed operating costs of a container vessel on a designated route, together with the voyage cost including the port charges at Montreal and Felixstowe and estimated the cargo distribution.

Given the opportunity, it would have been preferable to establish the actual cost for the other selected European ports, i.e. Antwerp, Hamburg, and LeHavre.

In order to complete the window on the industry, the cost of marketing and sales should be examined as well as identifying and quantifying the various inland transportation costs associated with the movement of containers to their final destinations.

Finally, I would recommend that the definition and identification of costs developed in the study be programmed into a model.

I would be pleased to assist in any way I can. I trust that the attached report will meet with your approval.

Yours very truly,

ACKNOWLEDGEMENTS

The author is indebted to:

- James E. Balfour, his colleague, for his advice and assistance
- the various sources contacted and listed in this report, for the assistance and advice provided.

Philippe I. Georges

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CHAPTER 1

BACKGROUND AND INTRODUCTION

1.1 Background

The objective of the study as defined in the terms of reference, and as further emphasised in conversations between the Client and the Consultants, was to provide the Canadian Transport Commission with a window on the cost of operating a cellular, lift-on, lift-off container ship in the North Atlantic service between Canada and Europe, to identify and quantify all the various costs involved in operating such a vessel.

The vessel to be chosen by the Consultants for the study of detailed costs was to be in the size range currently operating in the trade in the 1800 T.E.U. range and to be typical of the second generation of container ships which has been developed on the basis of experience in the trade and fierce competition from non-Conference operators.

1.2 Introduction

In developing the study various assumptions had to be made, but in all cases the assumptions reflect actual practice and the most pragmatic choice.

With regard to the itinerary and frequency of service, we have developed an itinerary with a single North American port of call with the vessel discharging all her containers and loading all the outward containers at that port. We have also assumed a frequency of a weekly service out of that port. For purposes of the study, our Canadian port is Montreal. On examining the services offered by the various lines, only Montreal offers a single port full container vessel service to North Europe as opposed to services which offer a Canadian port of call only as part of their North American itinerary.

Four European destinations were chosen, namely Felixstowe, Antwerp, Hamburg and LeHavre, being ports which are presently used in the Europe-Canada container trade. There are various other combinations which could have been used but we have opted for the above assumption as being representative of the trade today.

There are no Canadian flag vessels engaged in this trade and an examination of the various container liner operations reveals that vessels utilised in the service tend to be of North European and United Kingdom flag.

We have chosen for purposes of the study the United Kingdom flag and registry.

The size of ship selected, i.e. capable of carrying 1800 T.E.U.s, is one of the largest and most efficient engaged in the service.

On the basis of these assumptions, and other as developed and supported in the study, a complete exposition has been presented which provides a breakdown and identification of all the costs of operating a container liner in the North Atlantic trade between Canada and the U.K./North Europe. Costs wherever possible are in 1984 dollars.

This was the Consultants' mandate and every available and useful avenue has been explored in developing real costs. The results in each area have then been tested by discussion with operators of ships and various industry sources to ensure that the figures truly reflect a representative and realistic situation.

*****

CHAPTER 2

1. Methodology

As stipulated by the terms of reference, the study required a complete analysis of a specific container service to Europe, based on the type of vessel currently in use, to develop and identify all the component costs of operating a vessel in that service.

The methodology adopted is based upon the Consultants' experience in analysing the cost of transport systems which are highly competitive in nature and in which, as a consequence, the operators are very guarded in their activities and very reticent to reveal any hard information which might be used to the detriment of their interests. Because actual figures are difficult to obtain directly from the operators, therefore, the Consultants have used secondary sources where necessary and have made assumptions in certain cases based upon various sources and their own experience.

Apart from contacts made with operators themselves, information was obtained from shipping agents, terminal operators, shipyards, ship owners and managers, the General Council of British Shipping, the National Maritime Board, the Shipping Federation, insurance underwriters and others.

The findings have been reviewed with operators to ensure that no significant differences exist between the developed costs and actual costs.

The characteristics and size of the designated vessel were developed from an examination of the container liners which are currently being operated between Canada and Northern Europe and the trends in ship size and speed which have led to the present ship configuration.

The capital cost of the designated vessel has been developed on the basis of a computer analysis of ships delivered in recent years and by consultation with shipbuilders.

Crew costs were assembled after consultation with the National Maritime Board, the General Council of British Shipbuilders and with shipowning and management companies. The latter also provided confirmation on the other components of vessel operating costs, both fixed and variable, for British ships in the North Atlantic trade.

Port expenses and cargo handling expenses were obtained during a visit to the port of Felixtowe. The Felixtowe costs were used in the other three European ports of Hamburg, Antwerp and Le Havre, it being found impossible to obtain detailed breakdowns of port expenses and cargo-handling expenses for these ports within the time frame and cost of the study.

Montreal port and cargo expenses were developed after consulting with terminal operators, stevedores, the Shipping Federation and the Port of Montreal.

Currency: The shipping industry tends to use U.S. dollars as the working currency, due to the various parity relationships and the variety of currencies used in the trade, i.e. Canadian dollar, Sterling, French Francs, Belgian Francs and Dutch Marks as well as U.S. dollars for capital cost, insurance. We have converted resultant costs and expressed these in U.S. dollars at the exchange rates shown in Exhibit 1.

The net result of all the analyses which have been performed in order to develop the total cost picture as provided by the study, is to provide a factual basis for a costing model which could be developed and used to assess quickly the effects of change in any of the individual cost components upon the overall cost performance or upon the economics of the service and changes thereto.

The model itself would be simple to programme and easy to use and would not involve any subsequent work once the model was complete, other than to enter the modified requirements into the computer and interpret the results.

If a decision is made to proceed with the construction of a model, it would be logical, first of all, to make a study of the revenue picture in the North Atlantic trade, particularly because freight rates have fluctuated violently in recent years through competition and because net revenue and the return on investment over the long term are important factors in decision making. Because a high proportion of the cargo carried is U.S. cargo, carried at non-Conference rates, it would also be necessary to study inland transport costs in order to evaluate their influence on the total transport system.

Exhibit 1

EXCHANGE RATES USED IN STUDY

Pound Sterling	=	$1.30 U.S.
U.S. Dollar	=	$1.30 Canadian
U.S. Dollar	=	2.89 Deutch Mark
U.S. Dollar	=	241.8 Japanese Yen
U.S. Dollar	=	8.86 French Francs

2. Limitations of the Study

Due to the competitive nature of the industry and the trade, there is a certain reticence on the side of the operators in divulging their costs and providing firm indications. We have had to develop our cost structure and assumptions by drawing on secondary sources, industry sources, past experience, some primary sources, practices of the shipping industry and, lastly, by researching various reports. The result, we feel, provides a reasonable indication of costs for our hypothetical vessel and route. We have attempted to develop a reasonable line of assumptions based on present practices. We have at every step attempted to validate our assumptions and line of reasoning wherever possible and as such the costs and assumptions have to be treated strictly as an indication of costs and not as firm figures.

As mentioned previously, actual cost figures for cargo handling costs and port expenses were developed for the Port of Felixstowe. Time and budget limitations precluded application of the same approach at the other European ports, viz Antwerp, Hamburg and LeHavre and, at the suggestion of the Client, the assumption was made that costs per T.E.U. and costs per port call are similar to those at Felixstowe.

We have however ascertained from a container operator source that costs at Felixtowe for both port and cargo expenses tend to be higher than those experienced at those other ports. This, in effect, makes the figures we have used appear on the high side. Given the opportunity, it would have been preferable to establish the actual costs at each port.

With respect to traffic breakdown or container distribution to European ports, because it is not within the scope of this study to undertake a traffic analysis of the Canada-North Atlantic trade, we have developed assumptions which we feel are reasonable and relate closely to average distributions; however, we would like to emphasise that the distributions used are indications for the purposes of this study only and as such should be treated accordingly.

Inland transportation costs and the identification of the various cost elements associated with this movement were not examined as this was not within the scope of the study. This element should be examined together with the various freight rates and box rates in order to complete the picture of the industry and to develop a rate of return or contribution to cost. We recommend that this element be considered by the client and that such a task be undertaken as Phase II of this study.

We would also like to recommend that the identification of costs developed be programmed into a model. We feel this is a relatively simple task and one whose cost would be relatively small when it is considered that it would result in a working tool which can be constantly updated.

CHAPTER 3

NORTH ATLANTIC CONTAINER TRADE

3.1 General

It is not intended to undertake an in-depth description or analysis of the Canada-North Europe container trade. This section will serve mostly to identify some of the elements that come into play in developing assumptions for the hypothetical vessel and route required by the study.

The North Atlantic is one of the shortest of the major deep sea routes with round trips ranging from between 7000 and 8000 nautical miles. There is a high volume of traffic with a large number of shipping lines participating in it. The North Atlantic container trade saw its first container vessel introduced in 1966. This container trade serves North Europe, Canada, the U.S. East Coast and the Gulf of Mexico.

We shall limit ourselves to comments in the Canada-North Europe container trade.

3.2 Canada-North Europe Container Trade

This trade is serviced by two principle groupings: carriers that are members of the Conference and those that operate outside it independently. The main North Atlantic conferences which service the routing of our hypothetical vessel are:

Canada-United Kingdom Freight Conference
Canada-Continental Eastbound and Westbound Conference.

The principal shipping lines that are members of the Conference are: Canada Line* (CP ships and Compagnie Maritime Belge), Manchester Liners, CAST, ACL (consortium consisting of Cunard Line (U.K.), Compagnie Générale Maritime (France), and Trans-Atlantic Steamship Company (Sweden)), Hapag Lloyd and Sealand.

---

* Now known as "Canada Maritime".

The independents are Polish Ocean Lines, Balt-Canada Line, Arctic Line, Falline (Federal Atlantic Lakes Line), and some lesser known operators, including the recently set up Yucan (Yugoslav Canada Line) and UAL Atlantic Line.

Container lines operating out of Montreal service the American Midwest as well as the Northeastern United States, using the extensive CN-CP rail networks linking these areas to Montreal. Routing U.S. cargo through the port and on to Europe is competitive to shipping it through U.S. ports where U.S. Conference rates are higher. Montreal has been gaining an increasing share of this market.

It has been indicated to the Consultant that some 50% of the containers handled by the lines on the Canada-North Atlantic trade in Montreal are of U.S. origin or for U.S. destinations and being shipped through to their ultimate destinations on through bills of lading, and not strictly conference cargo.

3.2.1 Container Line Operators

The Canada North Europe container trade has seen several major changes and rationalizations during the past two years. As a result of the fierce competition, rate wars, shipping overcapacity and a slackening world demand brought about by the recession, North Atlantic shipping lines lost millions of dollars, with rates falling in 1983 by about 35%.

Competition from CAST, which operated outside the Conference, and the takeover of Furness Withy (Manchester Lines parent company) by C.Y. Tung, resulted in a major re-organisation of the Canadian carriers, whereby Manchester Lines, CP Ships and Dart Container Line pooled their resources, replaced their small ships serving Montreal and Halifax with larger 1800 T.E.U. ships, rationalized their itineraries and used a common container terminal, Racine, in Montreal. This became known as the St-Lawrence Co-ordinated Service (SLCS). CP ships and Dart Can Inc. (owned by C.M.B.), merged their operations into Canada Line in 1983 to achieve economics of scale, merging their marketing, administrative and computer operations. Manchester Lines retained its own separate identity and remains in the SLCS. The service, using four 1800 T.E.U. vessels namely "CP Ambassador", "Canadian Explorer", "CMB Europe", and "The Manchester Challenge", operates a weekly service out of Montreal, calling at Felixstowe, Antwerp, Hamburg, Felixstowe and Le Havre, with a 28-day cycle for each vessel.

The ownership of the four container vessels in the SLCS is equally divided, i.e. Dart Can, CP Ships and Manchester Liners, owning a ship each with each having a further 1/3rd interest in the fourth vessel.

Canada Line markets 70% of the capacity of each sailing, whilst Manchester Line markets or is allocated 30% of the slots on each sailing to market for its own account.

Note: Canada Line changed its name to Canada Maritime on 1st October 1984.

CAST operate five ships with a capacity of 1500 T.E.U. each, operating from Montreal to Antwerp. These vessels are large bulk/container combination carriers. Their Eastbound voyages are combined with bulk cargo loaded at either Sorel, ThreeRivers, Quebec, Havre St-Pierre or Sept Isles. Their cycles are slightly different to the SLCS vessels, being slower and having to load and discharge bulk as well as break-bulk cargoes. However, they do try to offer a sailing every week. They operate out of their own container terminal.

Due to competition from Sofati and the various factors previously outlined, as well as over-expansion and losses on their other bulk shipping operations, CAST's parent company EuroCanadian holdings went into receivership. The Royal Bank of Canada, with some $275 million of shipping loans outstanding to it on the new vessels, moved in to protect its investment and took control of the container operations in 1983 to save it from bankruptcy.

Sofati, a competitor to CAST, also operating outside of the Conference, was subsequently taken over by CAST, its container operations wound up and the company eventually sold. CAST then increased its rates and was admitted into the Conference. Under the stewardship of the Bank, CAST has recently been going through a period of relative stability with rising rates on the North Atlantic.

With regard to the other operators, we will briefly touch on them.

ACL: operate two services from North America to Europe with a weekly frequency.

Service 'A'

Halifax
New York
Portsmouth
Baltimore
Wilmington
New York
Halifax

to

Liverpool
LeHavre
Antwerp
Bremerhaven
Gothenburg
Liverpool

Service 'B'

Halifax
New York
Portsmouth
Baltimore
New York
Halifax

to

Rotterdam
Gothenburg
Rotterdam
LeHavre

The vessels used are RoRo vessels with varying container Lift-on Lift-off capabilities; see Exhibit 2 for details of vessels. They handle a variety of different cargo: RoRo, container and breakbulk. As will be seen, the Canadian call is only part of their North American itinerary. Thus, the cargoes handled at Halifax tend to be of either Canadian origin or for Canadian destinations. This operation cannot be strictly compared to the cellular container ship services.

Sealand: has only recently joined the Conference and offers a weekly service with three 1700 T.E.U. cellular container vessels operating as follows:

Halifax
Port Elisabeth N.J. (U.S.)
Portsmouth (U.S.)

To

Rotterdam
Bremerhaven

The Canadian call is only part of their itinerary.

Hapag Lloyd: operate a weekly North American service to Europe, utilising three cellular 1800 T.E.U. container vessels.

Halifax
New York
Halifax

to

Southampton
Antwerp
Rotterdam
Hamburg
Bremerhaven

As with Sealand and ACL, this service is not a pure Canadian single port destination but part of a North American itinerary.

Exhibit 2 - Sheet 1 of 2

VESSELS CURRENTLY OPERATING ON THE CANADA - NORTH EUROPE SERVICE

NAME	BUILT	LENGTH OVERALL	BREADTH	DRAFT	G.R.T.	N.R.T.	D.W.T.	T.E.U's	Hp	SPEED (knots)
SLCS (Cellular)										
CP Ambassador	1971	231.55	30.58	10.60	31,036	17,658	29,398	1,852	29,000B	22.0
Manchester Challenge	1970	231.55	30.58	10.084	31,036	17,658	28,488	1,535	29,000B	23.0
Canadian Explorer	1978	218.60	31.11	11.773	26,051	15,762	33,869	1,737	33,030B	23.0
CMB Europe	1970	231.55	30.58	10.084	30,950	20,847	28,484	1,556	29,000B	21.0
ACL (RoRo vessels)										
Atlantic Cognac	1970	212.07	28.10	9.31	15,351	7,384	18,549	1,545	35,000S	23.0
Atlantic Cinderella	1970	212.07	28.10	9.31	15,437	7,385	18,445	1,545	35,000S	24.0
Atlantic Champagne	1969	212.05	28.10	9.31	15,351	7,384	18,549	1,545	35,000S	23.0
Atlantic Song	1967	222.87	26.40	9.26	15,000	7,800	21,193	1,884	20,700B	20.0
Atlantic Saga	1967	222.87	26.40	9.26	15,000	7,800	21,193	1,884	20,700B	20.0
Atlantic Star	Rebuilt 1976	"	"	"	"	"	"	"	"	"
Atlantic Service	"	"	"	"	"	"	"	"	"	"
Atlantic Concert	1984	250.0	32.26	10.70	25,362	12,696	37,200	2,157	23,300B	17.5
Atlantic Compass	"	"	"	"	"	"	"	"	"	"
Atlantic Companion	1984	250.0	32.26	10.70	25,362	12,696	37,200	2,157	23,300B	17.5
Atlantic Conveyor	"	"	"	"	"	"	"	"	"	"
Atlantic Cartier	1984	250.0	32.36	10.70	25.362	12,696	37,200	2,157	23,300B	17.5

Exhibit 2 - Sheet 2 of 2

VESSELS CURRENTLY OPERATING ON THE CANADA - NORTH EUROPE SERVICE
(Continued)

NAME	BUILT	LENGTH OVERALL	BREADTH	DRAFT	G.R.T.	N.R.T.	D.W.T.	T.E.U's	Hp	SPEED (knots)
CAST (Combo Carrier)										
CAST Caribou	1981	235.62	32.31	13.483	40,003	28,874	70,940	1,466	13,600B	14.75
CAST Muskox	1982	235.01	32.31	12.801	40,203	28,623	70,000	1,466	13,600B	14.75
CAST Otter	1982	235.01	32.31	12.801	57,200	-	70,000	1,466	13,600B	14.75
CAST Husky	1982	235.01	32.31	12.801	40,293	28,623	70,000	1,466	13,600B	14.75
CAST Polarbear	1982	235.01	32.31	12.801	36,000	-	70,000	1,466	13,600B	14.75
SEALAND (Cellular)										
Sealand Express	1980	226.98	30.61	10.026	24,337	16,102	23,676	1,678	30,150B	22.0
Sealand Independence	1980	227.01	30.61	10.002	24,337	16,102	22,957	1,678	30,150B	22.0
Sealand Voyager	1980	227.01	30.61	9.502	24,337	16,102	22,963	1,678	30,150B	22.0
HAPAG-LLOYD (Cellular)										
Dusseldorf Express	1977	209.92	32.20	11.00	32,928	19,598	32,928	1,758	24,492KW	21.5
Nurnberg Express	1978	209.92	32.20	11.00	32,931	19,598	32.471	1,758	24,492KW	21.5
Stuttgart Express	1977	209.92	32.20	11.00	32,928	19,598	32,471	1,758	24,492KW	21.5
POLISH OCEAN LINES (Con/Ro)										
Sikorski	1981	203.0	31.7	8.11	30,086	14,380	22,600	1,417	29,000B	21.65
Pulaski	"	"	"	"	"	"	"	"	"	"
Kosciuszko	"	"	"	"	"	"	"	"	"	"
Starzynski	1981	203.0	31.7	8.11	30,086	14,380	22,600	1,417	29,000B	21.65

The Lines operating outside of the Conference are, amongst others:

Polish Ocean Lines: operating a weekly service using four RoRo, Lo/Lo vessels of approximately 1100 T.E.U. capacity. Their service to Canada is part of a North American itinerary namely:

Halifax		LeHavre
New York	to	Rotterdam
Baltimore		Bremerhaven
Wilmington		Gydnia

Arctic Line, Baltic Line and Falline: operate a service from Montreal and Halifax and other ports if offered sufficient inducement to four European ports and a Soviet port, but their itinerary varies from ship to ship.

Ships used on the service are Ro/Ro ships and dry cargo vessels, they carry containers and have an approximate capacity of 400 T.E.U.

Falline (Federal Atlantic Lakes Line): operate a service every 3 weeks from Montreal and Great Lakes ports to Antwerp and Rotterdam. Vessels used on this independent service, for containers, steel and general cargo, are Great Lakes size bulk/container combination carriers.

There have been two recent entries to the trade, Yucan and UAL Atlantic. We understand the former will operate between Montreal and Antwerp and the U.K., whilst the latter will also operate between Montreal and Antwerp and Rouen. We understand that these services are a Container/Conventional cargo service. Frequency is yet to be established. The container capacity of the vessels to be utilised is approximately 400 T.E.U. each.

3.3 Trade Imbalances

Eastbound and Westbound cargoes in this trade are affected by various factors which result in trade imbalances. These factors are economic situation, seasonal demand and fall-offs and strength of dollar. Presently, Westbound cargo, which commands a higher rate per box, is very strong, with vessels sailing full and in some instances leaving cargo behind. This strong demand is due to the strength of the dollar against European currencies, which make imports into North America cheaper. Eastbound traffic on the other hand has been weak. While the Canadian dollar has slipped in value against the U.S. dollar, it has remained higher than most European currencies. This has made Canadian exports as well as U.S. exports to Europe expensive. Therefore the Eastbound sailings are booked with approximately 70% of capacity, the redundant slots being taken up by empty containers returning to Europe.

CHAPTER 4

DEVELOPMENT OF DESIGNATED VESSEL AND ROUTE

4.1 General

In developing the cost of operating a hypothetical container vessel on the Canada-North Europe trade, we have had to establish certain parameters and develop some specific assumptions in order to identify the various elements of operating costs related to present day costs. This chapter will limit itself to establishing all the various assumptions associated with the vessel and the proposed route.

4.2 The Vessel

In developing the characteristics and size of the designated vessel, we examined the various container lines and their vessels operating on this route. As we are primarily interested in the cellular type vessel, we have had to limit ourselves to that vessel as against the RoRo and Combo type vessels. The result is a vessel size which is related to the optimum second generation cellular container ship. The characteristics of the ship, viz length, beam, draft, horsepower, etc., and the container-carrying capacity, are all very similar to those which have been evolved by operators who pioneered the service between Canada and Northern Europe with considerably smaller ships and whose experience with the competitive nature of the trade has led to the current size and type of ship.

Most of the Conference ships are concentrated in the range up to 1800 T.E.U.'s.

Speed: Although most of the existing container liners are capable of higher speeds (and do make use of this capability when delays or tightened schedules require it), with escalation in fuel costs, speeds have dropped and most lines now operate itineraries with service speeds of less than 20 knots. The designated vessel is capable of 22 knots at the maximum continuous rating of the engine but in conformity with current practice in the industry, the average sea speed on voyage is calculated at 17 knots, the speed required to operate a 28 day schedule.

The present optimum vessel capacity is in the 1800 T.E.U. range (cellular vesels). These vessels appear able to fulfill their requirements. In trying to establish the number of boxes that the vessel will actually carry, we have had a certain number of difficulties. Though some vessels, for example the Canada Line ships, have a T.E.U. capacity in the vicinity of 1800, Lloyds Register and other sources indicate a capacity of only 1595 T.E.U.'s. This situation we found in various examples.

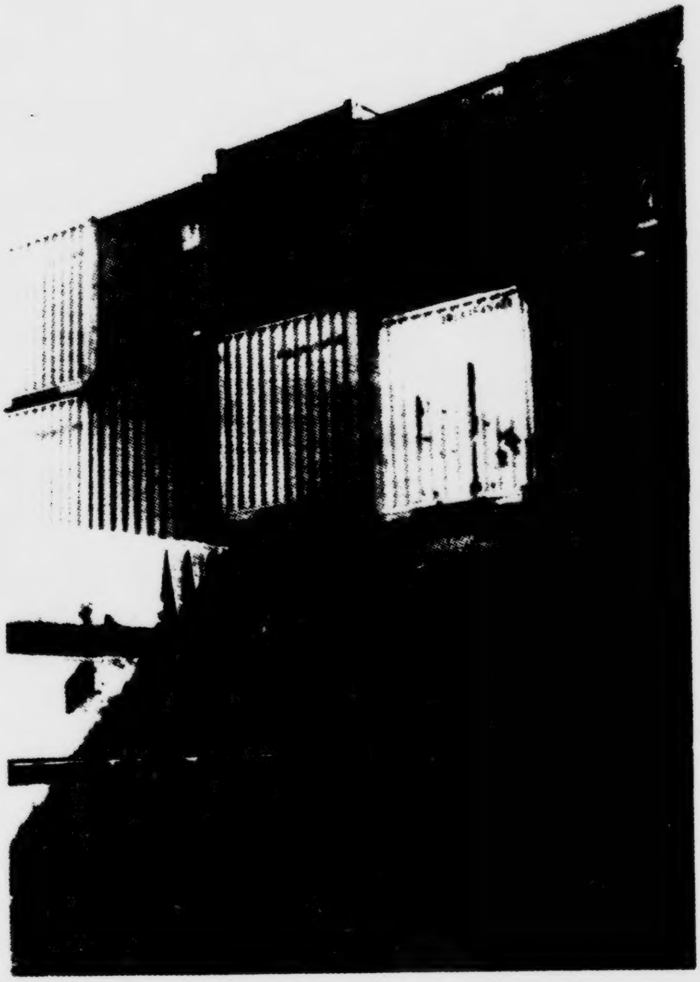
Cellular container ships carry a large number of containers on deck as seen on page 17; deck containers make a major contribution to total container capacity and can represent on average around 30% of the total capacity, although in some vessels this can be higher.

The cellular vessel will have containers stacked on deck three to four high. Underdeck, the vessel is specially constructed for the stowage of containers in vertical stacks or cells normally six to seven high. The rated capacity of a container vessel is a nominal value based upon an assumed distribution of cargo. In practice, the distribution will vary, and so will the capacity, with containers of varying weights. The capacity is maximised when they are distributed according to their weight, with the light units on deck and the heavier units lower down. Another factor is the various types and sizes of containers actually carried; these vary from voyage to voyage and could include the following:

Half Height Containers	20ft x 4'
Half Height Containers	20ft x 4'3"
Dry Steel Container	20ft x 8'
Dry Steel Container	20ft x 8'6"
Ventilated Containers	20ft x 9'6"
Open Top Containers	20ft x 8'6"
Reefer Containers	40ft x 8'6"
Dry Steel Containers	40ft x 8'0"

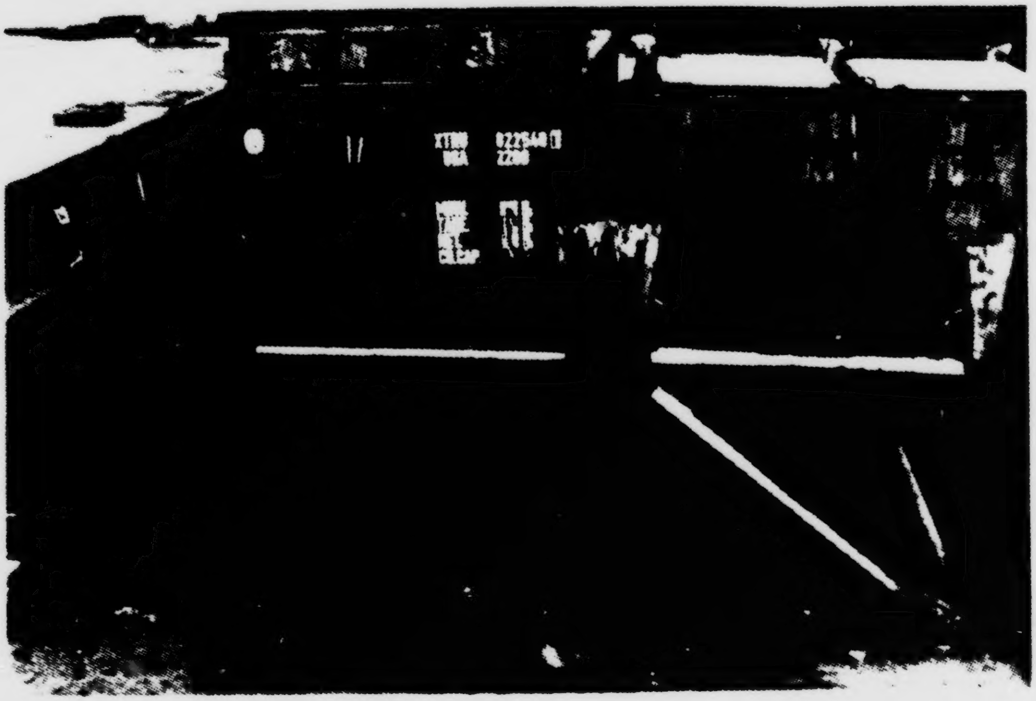
as well as bulk containers, flat racks and tank containers. All these impact on the actual number of containers actually carried on a voyage and the subsequent T.E.U. count.

Finally, the container distribution for the various ports in sequence and the vessel's stability will also have an impact.



Containers Loaded on Deck

Containers Loaded in Cells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Container Loading

After examining all the above factors and after discussions with industry sources, we have developed an average capacity for the designated vessel of 1,350 boxes or 1800 T.E.U.

With regard to the flag of the vessel, there are no Canadian flag container vessels on the North Atlantic; present carriers tend to be under North European registry or United Kingdom.

We have assumed the latter registry for the hypothetical vessel so that we can determine the manning and crew costs for such a crew on such a vessel under that flag.

Our crew size has been assumed at 28 men. Although this is current, the trend is for a reduction to between 22 to 25 men. This is discussed in Chapter 6.

Because we have assumed the Canadian port of call as Montreal (see 4.3.1), in order for the vessel to perform during the winter months, the vessel will have to be Ice Class I, that is, ice strengthened to negotiate the ice in the St-Lawrence during the winter months. This factor is discussed in connection with the capital cost on the ship.

4.2.1 Designated Vessel Characteristics

Flag:	British
Crew:	28 men
Dimensions:	L.O.A. 230 meters
	Length B/P 220 meters
	Breadth: 31 meters
	Depth: 16 meters
	Draft: 10.5 meters
	G.R.T.: 31,000
	D.W.T.: 29,000
	N.R.T.: 18,000
	Max Speed: 22 knots
	Service Speed: 17 knots
	B.H.P.: 29,000
	Fuel consumption: 50 tons + 2 1/2 tons O.M.D.

4.3 Service & Frequency

In developing a frequency and pattern for the designated route, we examined all the itineraries and frequencies of the various lines operating out of Eastern Canadian ports.

In this very competitive trade, it evolved that the acceptable level of frequency is a weekly service, that is, an advertised sailing from the port each week to the European destinations. This assumption we have adopted.

4.3.1 Canadian Port

In considering the itinerary, the designated vessel is a large, 1800 T.E.U. capacity vessel which operates out of a single Canadian port and no U.S. ports. The size of the vessel, together with a weekly service frequency, means that the vessel must discharge a full load at that port and load a full cargo of containers at that port for Europe. Canadian bound or origin cargo cannot warrant such a vessel in this competitive trade and consequently the vessel must service U.S. bound or U.S. origin cargo as well. In order to achieve this, the Port of Montreal was chosen as the Canadian port of destination in that the port is connected with extensive CP-CN rail networks and serves the U.S. North East as well as the American Mid West. Containers going through the port for those destinations from Europe is competitive when compared to the same cargo going through U.S. ports. As such, we have assumed that the single Canadian port on our hypothetical service is Montreal.

4.3.2 European Port Itineraries

In regard to the European ports, we have found in general that most container lines serve a minimum of 3 to 4 ports with two calls, for operational reasons, being made at the European ports with the largest volume, one call to discharge and the second call to load. Most lines will serve the market through a port in the United Kingdom, France, West Germany, Belgium, or Holland. After evaluating the various container services, we have selected the following container ports: Felixstowe, Antwerp, Hamburg, and LeHavre.

Felixstowe: is the United Kingdom's leading container port, with three container terminals operating within the port. Felixstowe is well placed to serve the main consuming and producing areas of the United Kingdom and is also strategically placed for container lines, fitting neatly and economically into the sailing schedules which embrace other North West European ports.

Hamburg: is one of Germany's leading container ports and is positioned so that it serves North Germany, East Germany and Scandinavia, especially when considering the flow to or from the Canada-U.S.-North Atlantic trade.

Antwerp: is Belgium's principal container port and plays a dominant role in the Europe-Canada-U.S. trade. It is so placed geographically, together with its infrastructure, that the port is used to serve Northern France, Southern Germany, Holland and Italy.

LeHavre: is France's principal container port, with three large container terminals operating in the port and some 18 lines calling there and serving North America only. The port serves the French market.

The hypothetical or designated route includes calls at the above ports, with the first call at Felixstowe to discharge, then on to Hamburg and Antwerp to discharge and load, returning to Felixstowe to load only and then to LeHavre to discharge and load before sailing for Montreal.

4.4 Container Cargo Distribution

This has been developed from current trends in the trade to and from the selected ports after consultation with industry sources. Our figures should be seen only as approximate indications for purposes of calculations in this study. As indicated in Chapter 3, trade imbalances exist currently on the North Atlantic and the vessels sailing Westbound are full whilst the Eastbound sailings have unused capacity of around 30%. We have tried to estimate empty container breakdown to the various ports for purposes of container distribution. We have used a number of boxes with the approximate number of T.E.U.s shown in brackets.

Designated Vessel Capacity (1800 T.E.U.) - Boxes carried 1350, made up of:

840	x 20ft containers
60	x half height 20ft containers
20	x 40ft Reefer containers
430	x 40ft containers
1,350	Containers (1800 T.E.U.s)

Westbound voyages, as previously indicated, will have a full capacity whilst Eastbound voyages will carry some 400 empty containers.

The container distribution per voyage has been estimated as:

	Eastbound					Westbound	
Felixstowe	450	+ 200	empty =	650	(870 T.E.U.)	550	(735 T.E.U.)
Hamburg	150	+ 50	empty =	200	(265 T.E.U.)	200	(265 T.E.U.)
Antwerp	200	+ 100	empty =	300	(400 T.E.U.)	400	(535 T.E.U.)
LeHavre	150	+ 50	empty =	200	(265 T.E.U.)	200	(265 T.E.U.)
	950	+ 400	empty =	1,350	(1800 T.E.U.)	1,350	(1800 T.E.U.)

We deem any differences in the above distribution between the ports would have an insignificant effect on our cost calculations.

4.5 Schedule

The time required for the round trip from Montreal, serving 4 ports in Europe, is 28 days. With a scheduled frequency of a weekly sailing on a regular service with sailings on a specific day, four ships will be required to maintain the service, offering 52 sailings a year out of Montreal and each ship performing 13 round trips per year.

4.6 Container Average Weight

Average cargo weights per container for calculation purposes have been estimated as follows:

20 ft containers at 13 tons representing 2/3 of boxes
40ft containers at 19 tons representing 1/3 of boxes

This results in an average weight per aggregate box of 15 tons or 11.25 tons per T.E.U.

4.7 Bunkering Pattern

For purposes of the voyage calculations, we have assumed that the vessel bunkers (fuels) in Montreal for the round trip and this is done concurrently with the working of cargo at the port.

4.8 Vessel Operating Days

The type of vessel envisaged on this route will be subject to a refit of approximately 14 days duration, every two years. This results in 358 operating days per annum. During periods of vessel refit and dry docking, the schedules and frequencies are maintained with the other vessels making up the time with faster turnarounds, the vessels having the capacity to do this with their extra speed and the time margin available in the 28 day cycle.

This section concludes all the principal basic assumptions used in the study.

* * * * * * *

CHAPTER 5

CONTAINERS

5.1 Types of Equipment

In the Canada North Europe Atlantic Trade a large variety of container boxes is used. These consist mainly of twenty foot, forty foot (steel, aluminum or G.R.P.), half height (for ingots), open tops, flat racks, bulk, open top (for copper wire, etc.) and reefer containers, the lengths being 20 and 40 feet. Height varies between the 1/2 height 4 foot and 4 foot 3 inches, the 8 foot, 8 foot 6 inches and 9 foot 6 inches ventilated container. There can be as many as 20 types of containers used in the trade. However, as far as lengths go, the 20 foot steel container is the backbone of the Canadian trade with the bulk of US origin cargo being carried increasingly in 40 foot containers. The two principle operators moving US origin container cargoes through Canadian ports are Canada Line and CAST and this can represent some 50% of the cargo they carry. CAST were a purely 20 foot container carrier but have now increased their inventory of 40 foot boxes. They do not handle half height containers.

Canada Line uses a large variety of boxes as a result of the various equipment owned and used by the members of the Consortium viz Manchester Liners, Dart and CP ships, all of whom had different philosophies and approaches as well as different types of ships used. The ships have now been rationalised and standardised and the container inventory is also going through a process of rationalisation and consolidation and a standard approach is developing.

The 40 foot box is in increasing demand due again to the large proportion of US origin cargo. The proportion of 20 foot to 40 foot containers varies from voyage to voyage, depending on the amount of US cargo, the number of empty containers and whether it is the Eastbound or the Westbound leg. On the whole it appears that the 40 foot box represents between 30 and 50% of the T.E.U. inventory capacity.

ACL have the same demand and requirement for 40 foot boxes and their proportion of 20 to 40 foot boxes in their inventory is in line with the other carriers.

Twenty Foot Container

Half Height Container

Leasing companies also confirm the increasing demand for 40 foot boxes on the Europe North Atlantic route and indicated a similar ratio in 20 foot to 40 foot containers.

For our designated vessel we have assumed that 1/3 of the inventory as well as the voyage distribution of boxes are 40 foot containers. This assumption was regarded as reasonable after discussions with the operators, being close to the current trend.

5.2 Leasing of Containers

Container line operators have the option of owning their containers outright or leasing them on long term or have a strategic core of owned containers, supplementing it with leased containers on an "as required" basis. This tends to take care of any fluctuations in equipment requirements and satisfies their short term needs. The economic costs of leasing containers on long term hire may not be significantly different from the cost of owning them. Operators choose long term leases rather than purchase usually for tax or cash flow reasons. Short term leases are on a per diem basis with the rate fixed dependent on the type of container, where it is picked up and where it is finally deposited. In addition, there could be a drop off charge imposed, depending on whether the container is deposited in a surplus or high demand area.

Leasing companies claim to offer cost advantages by better control of movement of their containers and economies of scale. In our designated route, none of the lines use a totally leased inventory of containers.

5.3 Container Inventory

Container line operators take different approaches to the ownership of containers.

Some large operators e.g. Barber Line, take the approach of leasing all their equipment on a long term basis (5 years), with a protected margin of fluctuation in the number of boxes on hire, say 20%. This gives the operator a measure of flexibility.

On the Canada-Europe trade approaches vary: CAST for example do not lease any boxes and believe in outright purchase of their equipment; they limit themselves to basic steel boxes of 20 feet and 40 feet. However, if a shipper provides them with a special type of box for their cargo, they will carry it in that it is owned or leased by the shipper. ACL have a similar approach. They tend to lease any excess requirement from sister companies within their consortium, all the boxes being owned by the Consortium members.

Canada Line use their own inventory as inherited from the members of the consortium.

On the whole, they own 80% of their inventory with the balance being leased on either a trip or round trip basis. This gives them flexibility to drop off containers when demand falls off during periods of seasonal volume adjustments and also when imbalances occur.

5.4 Number of Sets Required per Ship

Containers can represent a significant part of a carrier's costs. The number required for a service depends on the frequency, route length, inland transportation, ultimate destinations inland and other associated parameters. The number of round voyages of a box per ship year is a key factor. On the North Atlantic, this varies in the Canadian trade, from between 5 to 8 round trips per year and the inland turnaround time varies from close to 15 days to over 40 days.

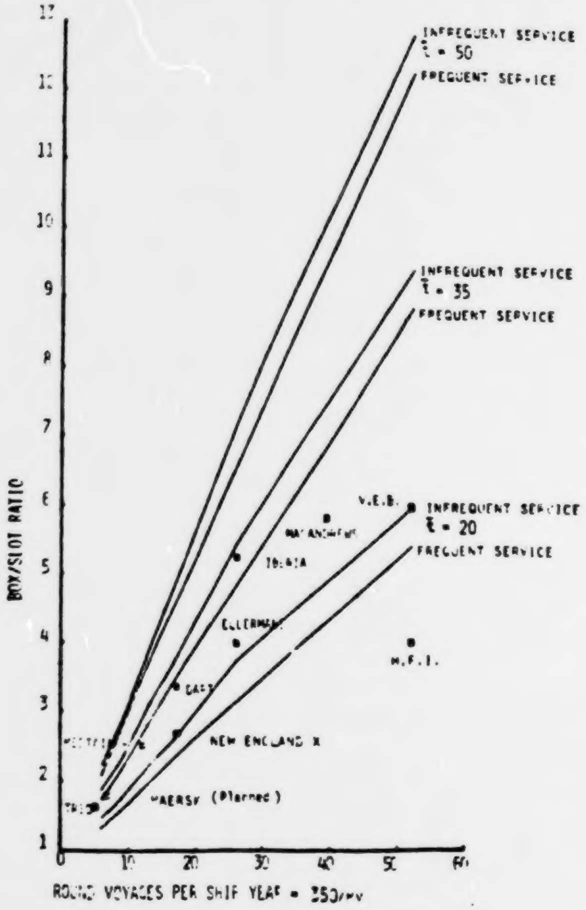
We have assumed that our designated box will perform 6 round voyages per ship year. This will result in an inland turnaround time of approximately 30 to 35 days. This will put the number of sets required per ship at approximately 3 sets.

We have contacted various industry sources and they have indicated that 3.5 to 4 sets could be ideal although we have not been able to see any substantiation of this. In fact, on close examination, none of the operators on the designated route have 3 sets; it tends to lie between 2.6 to 2.9 sets per ship. A reasonable and conservative assumption would be 3 sets of containers per ship.

Reproduced here as a point of interest is a graph from a study by E.D. Edmond and A.J. Wright Exhibit 3 in which the number of sets per ship is shown against the number of round voyages per ship year. From this we take 30 to 35 days as mean box inland turnaround time in days on a frequent service, against 13 voyages per ship year. This results in 3 sets per ship.

Exhibit 3

ESTIMATING THE NUMBER OF SETS OF CONTAINERS FOR CONTAINER SHIPS



1. Box/Slot Ratios and Number of Round Voyages/Ship

To the capital cost of the ship must be added the cost of the 3 sets of container equipment.

5.5 Cost of Containers

Various sources were consulted in determining and developing the cost of containers.

Several difficulties arose in the process: low levels of demand, intense competition in the industry, and fluctuation in currencies against the US dollar, have made historical data a poor base. We have therefore found large fluctuations in prices for standard boxes. Another factor is the timing and the quantity of the inventory to be purchased.

In the analysis of offered prices of 20 foot steel boxes, it was found that these are currently available from the Far East at around US$2,200 per box with 40ft boxes being offered at $3,200 F.O.B. Far East. Container liner operators tend to order higher specification steel boxes than those offered on the open market and tend to pay higher prices than those presently offered in the market today. One larger operator orders boxes in France whilst another prefers the United Kingdom. Though more expensive, these boxes are sturdier and have a longer life.

For our designated inventory, we have assumed a high specification box, as used by existing operators on the Canada North Atlantic service.

We have assumed the following prices:

20 ft steel container	US$3,000
40 ft container	$3,600
Half height 20 ft steel container	$3,000
Reefer container incl. refrigeration unit	$16,000

Inventory Cost for the Container Fleet

As determined in Chapter 5, to maintain the frequency of service on the designated route will require a fleet of ships with a slot capacity of 1,800 T.E.U. or carrying a mixture of 1,350 boxes.

Basis: 1,350 boxes per voyage made up as follows:
2/3 - 20 ft or 900
1/3 - 40 ft or 450
Total containers per ship: 1,350 boxes
This is broken down further as follows:

Boxes		T.E.U.'s
840	20 ft steel containers	840
60	Half height 20 ft steel containers	60
20	40 ft reefer containers	40
430	40 ft steel container	860
1,350		1,800

5.6 Costing of Inventory

								US$
840	x	3 sets x 4 ships	=	10,080	20 ft	x $ 3,000	=	30,240,000
60	x	"	=	720	20ft	x $ 3,000	=	2,160,000
20	x	"	=	240	reefer	x $16,000	=	3,840,000
430	x	"	=	5,160	40 ft	x $ 3,600	=	18,576,000
				16,200	boxes (21,600 T.E.U.)			$54,816,000

It has been assumed that a financing package would be available in line with that available for the purchase of the ship. Manufacturers, when faced with a large order, can offer some very keen terms. The financing cost calculation is found in Exhibit 4.

Exhibit 4

CONTAINER INVENTORY FINANCING COST

Interest at 10% - 8 1/2 yrs

Payment No.		Principal	Principal Payment	Interest Payment	Total Payment
Delivery		US$13.7040 m.			
6 mo.	1	12.8979	.8061 m.	.6850	1.4911
12 mo.	2	12.0918	.8061 m.	.6449	1.4510
1 1/2 y.	3	11.2857	.8061 m.	.6046	1.4107
2	4	10.4796	.8061 m.	.5643	1.3704
2 1/2	5	9.6735	.8061 m.	.5240	1.3301
3	6	8.8674	.8061 m.	.4837	1.2898
3 1/2	7	8.0613	.8061 m.	.4434	1.2495
4	8	7.2552	.8061 m.	.4031	1.2092
4 1/2	9	6.4491	.8061 m.	.3628	1.1689
5	10	5.6430	.8061 m.	.3225	1.1286
5 1/2	11	4.8369	.8061 m.	.2822	1.0883
6	12	4.0308	.8061 m.	.2418	1.0479
6 1/2	13	3.2247	.8061 m.	.2015	1.0076
7	14	2.4186	.8061 m.	.1612	.9673
7 1/2	15	1.6125	.8061 m.	.1209	.9270
8	16	.8064	.8061 m.	.0806	.8867
8 1/2	17	-	.8061 m.	.0403	.8464
Cost of 3 sets of containers			13.704	$6.1668	$19.8708

per ship

Total Cost of Inventory

No. of containers (3sets x 4ships)	16,200
Total capital cost	US$54,816,000
Total interest cost	24,667,200
Total cost	US$79,483,200

5.7 Container Insurance

The container line operator owning his own equipment will protect his large investment, especially where the investment is funded by a bank or other institution, by insurance.

Coverage for total loss, war risks, strikes, risks and civil commotions and third party liabilities (i.e. loss or damage to third party other than cargo) is available through a "club" which specialises in the insurance of these risks, with a full understanding of the operator's business.

Premiums vary and are dependent on such factors as container size, value of inventory, service, experience of operator and maximum risk i.e. number of ships in the fleet which could be lost by virtue of being at sea.

After discussion with such a club, we have developed the following premiums:

> Paid in two installments: 0.25 per cent of value with a guarantee of a minimum premium should the inventory or its value fluctuate. A gross premium and a minimum premium is established with a maximum allowable drop or fluctuation in inventory value limited to 20% before the premium rate changes.

Therefore, our designated container inventory is assumed to be insured at the rate of .25 percent of value, i.e. $54,816,000 x .25 of 1% or $137,040 gross premium including brokerage. This being for 3 sets of containers on each of 4 ships on the North Atlantic trade -no deductible and a limit of liability of $10 million.

5.8 Container Repairs and Maintenance

The cost of maintenance of the container inventory is a significant factor. Boxes are handled many times and are susceptable to damage. The approach to this varies from operator to operator, with some undertaking their own repairs and refurbishing, others contracting out, whilst another option is to obtain insurance cover i.e. damage protection plan through a "club".

The first two options are considered by operators to be cheaper than the latter.

Another variable is the standard of repair which an operator will maintain. Some operators will undertake major refurbishment every five years whilst others will keep their inventory in a high standard of repair, which will tend to do away with the need for major refurbishing. Another factor is the age of the inventory and the quality of the boxes. The older the equipment, the greater the cost to maintain it.

The decision to repair or replace is another factor, considering that the second hand value of a 20 ft box is anything between $400-600 per box, a reasonable price, bearing in mind the replacement cost of $2,200-3,000 for a new container with a life of 10-12 years against a cost of refurbishment which could amount to $500-600 per box. The annual cost of repairs and maintenance varies between 4%-7% of the capital cost of the equipment.

Coverage under a Damage Protection Plan can be obtained at a cost of between $1.50-$2.00 per container day.

After discussions with industry sources, we have assumed a cost of $200 per box per annum for the designated inventory. This amounts to $3,300,000 per annum or 55¢ per container day.

5.9 Positioning of Empty Containers

This is the cost of re-positioning an empty container from one of the operator's depots or storage facilities to another area where it is required. Where a container is taken full inbound to an inland destination and moved to another area where it is required, in theory, there should be no cost if there is no imbalance in loaded movements. Shippers tend to pick up an empty box at a container depot positioned in strategic areas, load it and ship it out. Cargo is often booked to areas in inland destinations where there is little or no outward cargo offered for that box. It therefore has to be shipped to the operator's nearest container depot or wherever it is required after being unstuffed. This situation occurs on both sides of the Atlantic. An operator may sometimes opt to send a leased container on a one way lease with a drop off charge to that particular destination and dispense with the need to return the empty box, but this involves a cost as well.

5.9 Positioning of Empty Containers (cont'd)

In trying to develop a basis for this cost, we encountered difficulty in determining the proportion of empty movements that would incur a cost. These expenditures are treated in various ways by operators. Some of them ship it out via sister trucking companies or transfer the box to another member of the operator's consortium who may have a need for it, via one of their other container services.

The cost will vary from ship to ship and whether it is an Eastbound or Westbound movement.

On our designated vessel, we have assumed an Eastbound movement of 400 empty boxes and that each box on average incurs a cost of $200.00. This equals $80,000 per voyage or $4,200,000 per annum for the fleet.

Industry indications are of a cost of between $0.70 to $1.00 per day. Having used a larger ratio of container sets per ship, resulting in a greater number of containers days, the assumption used for our designated vessel appears reasonable.

5.10 Allocation of Container Equipment & Related Costs

5.10.1 Capital Cost

This covers the cost of the designated inventory together with financing costs. This is allocated on an annual basis per ship.

Container Inventory Capital Cost

Capital cost of 16,200 boxes	US$54,816,000
Finance cost	24,667,200
Total Cost	$ 79,483,200

Amortisation over 10 years = US$7,948,320 per annum for the fleet.

Annual allocation of expenses per ship ($1,987,080) to be borne by vessel and shown in Exhibit 13 as part of "Daily Vessel Cost Calculation".

5.10.2 Positioning of Empty Containers

This has been estimated at $80,000 per voyage and applied to the "Voyage Expense Calculation," Exhibit 21.

5.10.3 Repairs, Maintenance, Refurbishing and Insurance

Annual cost for repairs, maintenance and refurbishment is allocated on a per voyage basis of the service.

Container Maintenance, Repair & Insurance

Insurance Total Loss & Third party liability	US$ 137,040
Repairs & Maintenance	3,300,000
Annual cost over fleet	$ 3,437,040

This cost has been allocated on a per voyage basis, i.e.:

4 ships x 13 = 52 voyages per annum
$3,437,040 ÷ 52 = $66,097 per voyage.

This amount is shown in Exhibit 21 and forms part of the Voyage Expense Calculation.

CHAPTER 6

THE VESSEL

6.1 Capital Cost of Designated Container Liner

As a prelude to determination of the purchase cost of the particular size of container liner identified in the study, a range of sizes and costs of vessels delivered to their owners in 1983 and 1984 has been examined. (See Appendix A "Container Vessels Delivered".)

The results are shown in graph form in Exhibit 5, which gives an indication of the relationship between purchase cost and the number of TEU's which a vessel is built to carry.

It also provides information on where the individual vessels were built and the flag which they are qualified to operate under. From reference in Appendix A it will be noted that most of the container liners of the size under consideration built in the 1980's, have been constructed in the Far East.

All the vessels are cellular container ships of the lift-on/lift-off type which are readily comparable with each other -- no roll-on/roll-off vessels are included for example.

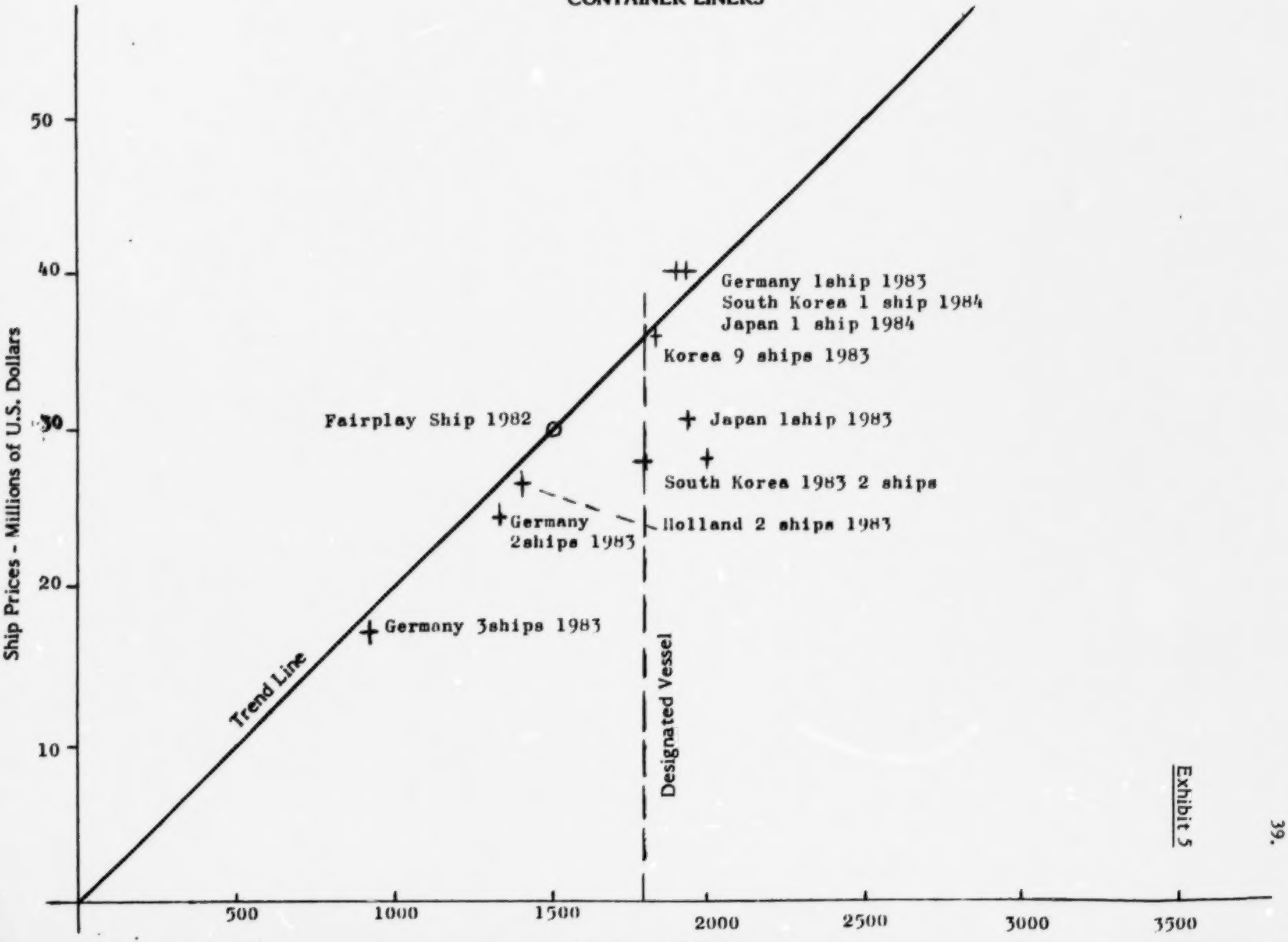
6.1.1 Trend Line

The graph represents a trend line of building prices for ships negotiated in the 1980's and delivered over the past 18 months. As such, it enables us to obtain a close approximation to the price of a ship for a given TEU capacity. Thus, for the designated vessel capacity of 1800 TEU's, the approximate price per vessel is US$36 million for a new ship to be operated over the next 10 to 15 years.

Some explanatory comments on the selection of vessels used to establish the trend line are in order:

Exhibit 5

RECENT BUILDING PRICES FOR CONTAINER LINERS



a) Vessels built in the Far East (Japan, South Korea, China and Taiwan) for operation under Far East registry have been excluded in the belief that such ships may be constructed to less stringent government and/or classification society requirements than those imposed by British and European flag operation. Such ships (of Far East registry), are in most cases noticeably cheaper than the others and do not reflect the true cost for operation under the British flag, as required for the designated vessel.

b) Details of payment terms arranged between the purchaser and the builder are not known in most cases. Where deals are known to be in cash, prices are generally lower and these have been excluded so as not to distort the trend line.

The ships which are included are almost certainly comparable, in general, in terms of financing and are compatible with the financing arrangements assumed for the designated vessel.

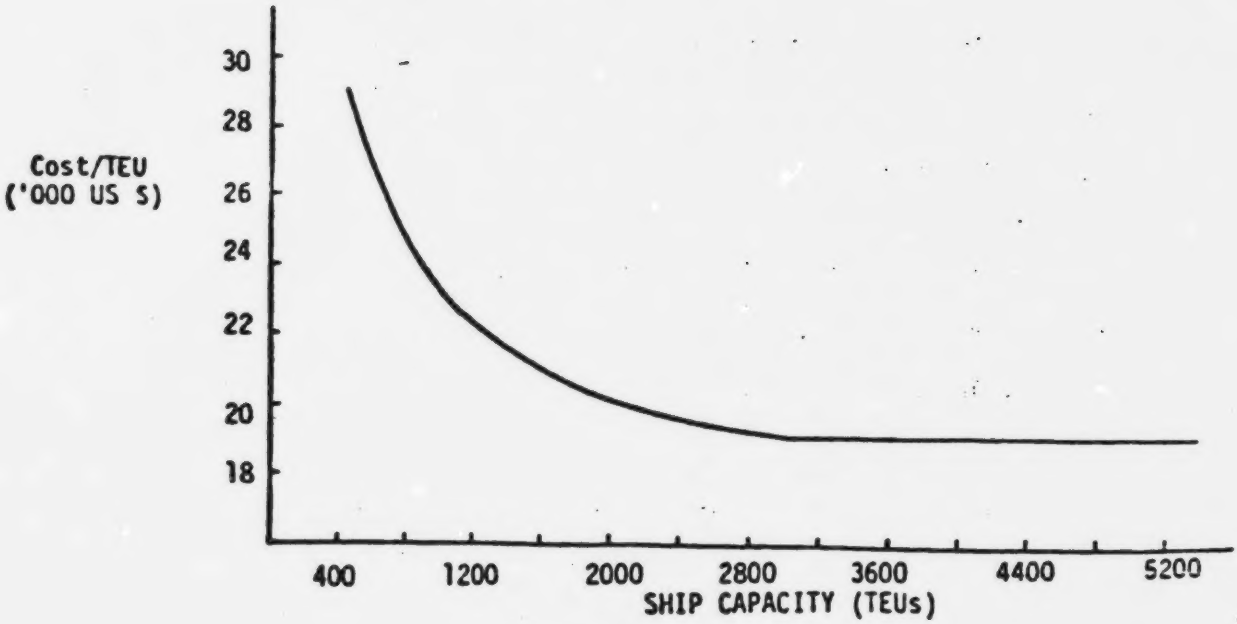
c) Where the number of ships of a particular size and design ordered from any builder exceeds one, this has been indicated. The effect of multiple ship orders is usually a slightly reduced price for each ship.

A number of information sources as well as a study of vessels delivered since 1976 were referred to in order to establish the ship's purchase price.

Several difficulties arose in the process: inflation, parity of currencies, together with shipyards' eagerness for work has made historical data a poor base on which to judge costs. Vessels ordered months apart for delivery at the same date have varied costs. Further, external factors, some of which are unquantifiable, influence the cost of ships. These include the variation in the cost of building ships in different countries; differences in Japanese export and domestic prices and the demand for ships and shipyard capacity at the time of ordering. Factors such as export credit terms and Government building subsidies have a substantial influence on the cost of a ship to a shipowner.

We attach Exhibit 6 "Capital Costs per TEU for a Range of Ship Sizes," which was developed in a study by the University of Liverpool Marine Transport Centre in 1977. This indicates a cost of $20,500 per T.E.U. for an 1800 T.E.U. size vessel.

Exhibit 6



CAPITAL COST PER TEU FOR A RANGE OF SHIP SIZES

6.1.2 The "Fairplay" Ship

Appendix A shows an abstract from Fairplay magazine in January 1983, giving a representative price for a 1500 TEU container liner based upon a detailed analysis of current contracts throughout the world.

The price at that time was US$34.5 million and is believed to include one set of 1500 twenty foot containers. After deducting the price of the containers at US$3,000 each, the price for building the ship is US$30 million.

6.1.3 Ships on Order

A review has been carried out of contract prices for container vessels currently on order for delivery 1984 to 1986 (see Appendix A). In most cases these prices are considerably below the trend line shown in the graph for vessels delivered in 1983 and 1984 and give the impression that prices calculated on the basis of the trend line may be high for vessels built in the next two years.

It is as well to point out two factors which may indicate that this reasoning is misleading:

1. All the low price ships on order are being built in Far East shipyards for owners who will operate them under Hong Kong or Taiwan registry. As indicated previously, this may involve less stringent construction standards and permit cheaper building costs.

2. While these low prices are in fact being contracted by shipyards at present, they are a reflection of a shipbuilding industry that is desperate to maintain its liquidity in the face of a dearth of new buildings and seems more concerned with obtaining orders than a proper return.

In the sense that this is, however extended it may be, a temporary, artificial climate for shipbuilding, we consider it inappropriate to give its effect undue weight in the context of the study. (See para. 1.8 for Far East price indication.)

The cost of our 1800 TEU designated vessel as indicated by the trend line in Exhibit 5 is US$36 million.

6.1.4 Ice Strengthening

Container liner vessels currently in year-round service between Northern Europe and Montreal are required to be ice-strengthened to Lloyd's Ice Class 1.

The designated vessels have been assumed to be especially strengthened as for ships intended to navigate in severe ice conditions, i.e. equivalent to Lloyd's Ice Class 1.

As a result, the building price for each ship has been increased by approximately 4 percent over the basic price established by the trend line to cover the cost of ice strengthening as described in Exhibit 7.

6.1.5 Purchase Cost

The actual capital cost for the designated vessel has been established, for the purpose of calculating operating costs, at US$37.4 million.

This is made up of a basic vessel cost of US$36.0 million plus US$1.4 million for Class 1 ice strengthening.

6.1.6 Financing Cost

The method of financing the building cost of the designated vessel has been based on the OECD guidelines for ship financing. The referred terms include a loan of 80 percent of the contract value repayable by 17 equal half-yearly instalments, with the first payment due 6 months after delivery of the ship. These credit terms were confirmed by British shipbuilders (Appendix B).

The interest rate is 7 1/2 percent, per annum on the declining balance but pre-delivery interest on loan drawings during construction can be capitalized and added to the contract price, in which case the interest rate is increased to 7 3/4 percent.

The 20 percent purchaser's equity is assumed to be carried at 13 percent interest and discharged over the same period of time as the building loan.

Exhibit 7

ESTIMATE OF ADDITIONAL COST OF CLASS 1 ICE STRENGTHENING

BASIC VESSEL COST

	Material Cost	Labour Cost	Total Cost
Hull steel	$ 6,000,000	$ 11,000,000	
Outfit	3,500,000	6,000,000	
Machinery and electrical	5,500,000	4,000,000	
	$15,000,000	$ 21,000,000	$36,000,000

ICE CLASS 1 VESSEL COST

	Material Cost	Labour Cost	Total Cost
Hull steel	$ 6,475,000	$ 11,850,000	
Outfit	3,500,000	6,000,000	
Machinery and electrical	5,575,000	4,000,000	
	$15,550,000	$ 21,850,000	$37,400,000

The increase in the material and labour costs for the hull steel covers the installation of intermediate framing, additional thickness of hull plating, increased rudder and sternframe scantlings, local re-inforcement of the bow, and fittings to direct ice away from the propeller. The increase in the material cost of the machinery results from the requirement to increase the diameters of the intermediate and propeller shafting and to improve the strength and quality of the propeller.

The financing cost calculation is shown in Exhibit 8.

Recovery of the total cost of financing is assumed to occur over the working life of the ship, viz 15 years.

6.1.6.1 Amortisation

For purposes of this study, the cost of the assets, that is the capital cost plus the total interest cost, has been amortised on a straight line basis over the life of the asset. Current practices apply a working life of 15 years on ships and 10 years on steel containers.

The method used in this study may appear conservative in that, interest cost has been applied to the entire capital cost of the asset, and no residual value has been applied against the cost.

Application of the rate of depreciation varies from country to country and from company to company, some using the straight line basis whilst others use accelerated or reducing balance depending on the tax regime.

6.1.7 Total Investment for Ship and Containers

	Capital	Interest	Total (US$millions)
Capital Cost of Ship	$37.40 m	$14.81 m	$ 52.21
Containers, 3 sets	$13.704 m	$ 6.1668 m	$ 19.8708
			US$72.0808

6.1.7.1 Total Cost of Fleet of 4 Ships with Containers

	Capital	Interest	Total (US$million)
Capital Cost of 4 Ships	$149.6 m	$59.24 m	$ 208.84
Containers, 12 sets (21,600 T.E.U.)	$ 54.816 m	$24.6672 m	$ 79.4832
			US$288.3232

6.1.8 Current Offered Prices - New Buildings

Three overseas shipyards were contacted to obtain current building cost indications for the designated vessel built to the requirements of the United Kingdom Department of Trade and of Lloyd's Classification Society (Ice Class I) with a ship financing package.

Far East sources indicated a cost of $24,000,000 cash for basic vessel or U.S.$29,000,000 for above requirements of designated vessel.

The total cost together with the cost of financing is shown in Exhibit 15.

DESIGNATED VESSEL - SHIP FINANCING COST

Capital Cost: $37,400,000

Payment No		80% Loan 7 3/4% Interest				20% Equity 13% Interest				TOTALS
		Principal	Principal Payment	Interest Payment	Total Payment	Equity	Equity Payment	Interest Payment	Total Payment	US Dollars '000
Delivery		$29.92				$7.48				
6 mo.	1	28.16	1.76	1.159	2.919	7.04	.44	.486	.926	3.845
1 yr	2	26.40	1.76	1.091	2.851	6.60	.44	.458	.898	3.749
1 1/2	3	24.64	1.76	1.023	2.783	6.16	.44	.429	.869	3.652
2	4	22.88	1.76	.955	2.715	5.72	.44	.400	.840	3.555
2 1/2	5	21.12	1.76	.887	2.647	5.28	.44	.372	.812	3.459
3	6	19.36	1.76	.818	2.578	4.84	.44	.343	.783	3.361
3 1/2	7	17.60	1.76	.750	2.510	4.40	.44	.315	.755	3.265
4	8	15.84	1.76	.682	2.442	3.96	.44	.286	.726	3.168
4 1/2	9	14.08	1.76	.614	2.374	3.52	.44	.257	.697	3.071
5	10	12.32	1.76	.546	2.306	3.08	.44	.229	.669	2.975
5 1/2	11	10.56	1.76	.477	2.237	2.64	.44	.200	.640	2.877
6	12	8.80	1.76	.409	2.169	2.20	.44	.172	.612	2.781
6 1/2	13	7.04	1.76	.341	2.101	1.76	.44	.143	.583	2.684
7	14	5.28	1.76	.273	2.033	1.32	.44	.114	.554	2.587
7 1/2	15	3.52	1.76	.205	1.965	0.88	.44	.086	.526	2.491
8	16	1.76	1.76	.136	1.896	0.44	.44	.057	.497	2.393
8 1/2	17	-0-	1.76	.068	1.828	-0-	.44	.029	.469	2.297
			29.92	10.434	40.354		7.48	4.376	11.856	52.210

Blended Average Interest Rate	4.40% per half year
(On declining balance)	8.80% per annum.

Exhibit 8

6.2 Fuel Consumption

The fuel consumption for the designated vessel has been calculated on the following basis:

Main Engine:	90% of maximum continuous rating for designated vessel = about 29,000 BHP and corresponding speed about 22 knots.

The vessel's schedule on the designated route is based on 17 knots speed which corresponds to about 13,500 BHP ($17^3/22^3 \times 29{,}000$) and main engine fuel consumption at 17 knots:

$$\frac{.34 \times 13{,}500 \times 24}{2{,}204} = 50 \text{ tonnes/day}$$

The service speed of 17 knots has been developed with the objective of maximizing fuel economy.

The vessel has the reserve engine capacity to increase the speed up to 22 knots to make up for lost time or to speed up the schedule when one vessel is out of service. The increase in fuel consumption is then roughly proportional to the ratio between the higher and the lower speeds taken to the third power, e.g.:

$$\text{Increased consumption} = 50 \times \frac{22^3}{17^3} = 108 \text{ tonnes/day}$$

Generators:	Fuel consumption in generators assumed at 2 1/2 tonnes/day at sea and in port.
Lubricating Oil Consumption	Assumed at 0.8 grams per B.H.P. for normal rated BHP of main engine, i.e. 23,200 grams/hour (including auxiliary machinery).

$$\text{Gallons per day: } \frac{23{,}200 \times 24}{453 \times .80 \times 10} = 153.64$$

$$\text{Gallons/year: } 153.64 \times 19.11 \times 12.8 = 37{,}582$$

Say 38,000 gallons

6.3 Manning

In the absence of mandatory international safe manning requirements and in order to minimize the risk of delays and difficulties for United Kingdom flag ships in foreign ports, the Department of Trade has operated a Safe Deck Manning Scheme since 1977, which has resulted in the individual assessment of U.K. ships and the issue of Safe Deck Manning Certificates.

The minimum levels of manning in order to obtain a Safe Deck Manning Certificate are stipulated in Department of Trade Merchant Shipping Notice No. M1041, issued in October 1982.

The Notice provides guidelines to be used in applying the basic principle of safe manning to ensure the safe operation of ships in the areas of:

Bridge watchkeeping
Mooring and unmooring
Watertight closing arrangements
Safety equipment and life-saving
Offshore vessel operation
Engine room watchkeeping
Machinery operation and maintenance
Medical equipment
Radio watchkeeping.

The Department of Trade, at the request of the owner, will state the manning in any sea-going U.K. registered ship to comply with the requirements of Notice No. M1041.

6.3.1 The National Maritime Board

The minimum requirements for manning of foreign-going ships as laid down by the National Maritime Board in the United Kingdom are described below.

However, the N.M.B. rules merely prescribe safe levels of manning in accordance with the stipulations of the Department of Trade and leave it to the ship operating companies to consult with the appropriate seafarers and their unions before determining an industrial management level.

6.3.1.1 Manning of Foreign-going Ships (The National Maritime Board)

6.3.1.2 Officers

Deck Department

Subject to the supply of navigating officers being adequate for the purpose, the number of certificated navigating officers in addition to the Master, to be carried in foreign-going vessels exceeding 1,600 tons gross, in respect of voyages for which a Crew Agreement is operated in the United Kingdom, shall be 3.

(In the event of a foreign-going vessel of over 1,600 tons gross sailing shorthanded from any port in the U.K. or abroad, without one of the navigating officers required by the Agreement, the two remaining navigating officers must each be paid an additional 50% of his own salary.)

Engine Room Department

Subject to its being practicable to provide the necessary accommodation and to the supply of seafarers being available, in foreign-going vessels exceeding 3,000 tons gross there shall be carried as a minimum in each watch, in addition to the engineer officer in charge of the watch, either a junior engineer or a senior mechanic, or a petty officer (motorman), or a motorman Grade 1.

6.3.1.3 Ratings

Deck Department

Deck manning certificates issued by the Department of Trade in accordance with Merchant Shipping Notice No. M1041 only prescribe the safe deck manning for ships.

Companies must consult with the appropriate seafarers' union(s) before determining an industrial manning level.

Engine Room Department

Subject to its being practicable to provide the necessary accommodation and to the supply of ratings being available, in foreign-going vessels exceeding 3,000 tons gross there shall be carried as a minimum in each watch, in addition to the engineer officer in charge of the watch, either a junior engineer, or a senior mechanic, or a petty officer, or a motorman grade 1.

Catering department

Minimum manning: foreign-going cargo liners and general traders:

a) Galley (subject to suitable accommodation being available):
Crew 20 to 35 - Chief cook and junior catering rating

b) Stewards
Total officers (including Master, Purser, Chief Steward or Catering officer but excluding cadets:

6 or under: Chief Steward and Junior Catering Rating

7 to 9: Chief Steward, Steward and Junior Catering Rating

10 to 12: Chief Steward, Steward, and two Junior Catering Ratings

13 and over: Chief Steward, Second Steward, Steward and Junior Catering Rating.

6.3.2 The General Council of British Shipping

The General Council of British Shipping indicates that on a conventional 1800 T.E.U. container vessel, manning levels call for 28 men in order to conform to all requirements for safe operation.

However, the G.C.B.S. also advises that on a new 2400 T.E.U. British Flag container vessel commissioned in 1984 the crew complement is only 22, as per Exhibit 9.

6.3.3 Designated Vessel

In developing the crew costs for the Vessel Operating Expense Calculation, the higher crew complement of 28 men was used in the calculations. The trend is for a further reduction of crew size on conventional container vessels on the trade to between 22 and 25 men. These are currently under negotiation.

Exhibit 10, shows the complement recommended in the designated vessel based upon current practice in the shipping industry for vessels of this size and type.

Exhibit 9

COMPLEMENT FOR 2400 T.E.U. CONTAINER VESSEL COMMISSIONED IN 1984*

Master	1
Chief Officer	1
Second Officer	1
Third Officer	1
Chief Engineer	1
Second Engineer	1
Third Engineer	1
Fourth Engineer	1
Fifth Engineer	1
Electrical Engineer	1
Catering Officer	1
Catering Ratings	3
I.D.S.	7
	21
Radio Operator	1
TOTAL COMPLEMENT	22

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*Provided by General Council of British Shipping.

Exhibit 10

CREW COMPLEMENT FOR 1800 T.E.U. DESIGNATED VESSEL

Master	1
Chief Officer	1
Second Officer	1
Third Officer	1
Chief Engineer	1
Second Engineer	1
Third Engineer	1
Fourth Engineer	1
Fifth Engineer	1
Electrical Engineer	1
Radio Operator	1
Catering Officer	1
Officers	12
Second Steward	1
Stewards	2
Chief Cook	1
2nd Cook	1
Carpenter	1
Bosun	1
Engine Room P.O.	1
Engine Room Ratings	2
Deck Ratings	6
P.O. and Ratings	16
TOTAL COMPLEMENT	28

6.3.4 Crewing Costs - Wage Scales

In the process of determining the appropriate cost figures for crewing the designated vessel on an annual basis, three lines of investigation have been followed:

1) The National Maritime Board (U.K.) Pay Scales
2) The General Council of British Shipping (for an indication of industry averages)
3) A United Kingdom Shipowning and management company (for a firm indication of actual pay scales currently in effect for vessels of similar size and service to the designated vessel).

6.3.4.1 The National Maritime Board Pay Scales

The National Maritime Board is a body incorporating representatives of employers and employees in the British shipping industry.

The wage structures stipulated by the N.M.B. are described in Appendix C and actual pay scales for officers, ratings and cadets are indicated.

However, these are basic minimum figures and as such are unrealistically low and according to the General Council of British Shipping the N.M.B. figures are meaningless in terms of current rates of pay. It is clear that the figures are not representative in the industry and few if any companies pay on the N.M.B. scale.

6.3.4.2 The General Council of British Shipping

The actual cost to owners for crewing their vessels is related to the individual company agreement. Over the years, substantial wage drifts from the N.M.B. rates have occured for various reasons:

a) Relatively high average age of personnel
b) High seniority levels
c) Shortage of personnel for certain ranks
d) Reduction in crew sizes and increase in work loads.

A shipping industry average, for ships in the unlimited trade, as indicated by the General Council of British Shipping is shown in Exhibit 11.

The G.C.B.S. indicates that container liner wage scales will tend to be higher than the figures indicated in Exhibit 11.

6.3.4.3 United Kingdom Shipowner

Exhibit 12 shows the wage scale for the designated vessel based on discussions with a ship owning and management company. These crew costs are used in the "Vessel Cost Calculations" and indicate the cost of filling each position. They include leave, sick leave, study leave, overtime, work bonuses, pension and social security, redundancy payments, etc.

Exhibit 11

SAMPLE OF WAGE SCALE FOR A BRITISH SHIP
IN THE UNLIMITED TRADE
(Foreign-going outside Europe)

(Industry average as indicated by the General Council of British Shipping and represents the cost of filling the job, i.e. includes overtime, allowances, etc.)

Position	Cost of filling position for 365 days	Includes Working days	Includes Leave days
	£		
Master	33,600	365	247
Chief officer	24,300	365	226
2nd officer	21,400	365	226
3rd officer	18,000	365	223
Chief engineer	31,300	365	248
2nd engineer	23,100	365	227
3rd engineer	17,400	365	222
4th engineer	14,500	365	220
Electrician	18,300	365	219
Junior electrician	14,500	365	212
Radio operator	14,500	365	220
Catering officer	18,000	365	218
I.D.S.	11,000(£210/week)	365	100
Catering ratings	11,000(£210/week)	365	100

NOTE: Container liner scale would tend to be higher than these rates.

Exhibit 12

WAGE SCALE OF DESIGNATED VESSEL

(1800 TEU container liner)

Position	Cost of filling position for 365 days*
Master	40,000
Chief officer	34,000
2nd officer	26,000
3rd officer	22,000
Chief engineer	38,000
2nd engineer	34,000
3rd engineer	24,000
4th engineer	21,000
5th engineer	18,000
Electrician	26,000
Radio operator	29,000
Catering officer	24,000
Sub-Total (12)	£336,000
2nd steward	12,000
Two stewards	23,000/2
Chief cook	16,000
2nd cook	12,000
Carpenter	19,000
Boatswain	15,000
Engine room P.O.	16,000
Engine room Crew (2)	24,000/2
Deck crew (6)	73,000/6
Total (16)	£210,000
Grand total (28)	£546,000

* Including wages, overtime, retaining wages, study and sick leave, pensions and social security, G.C. of B.S. contributions, and redundancies etc.

CHAPTER 7

VESSEL OPERATING EXPENSES

7.1 General

Here we will attempt to identify and define the various elements that together result in the vessel's operating expenses.

There are two main structures of expense, when considering the operation of a vessel, namely those which represent the components of the Daily Vessel Cost Calculations and those which form the Voyage Calculation Expenses. The latter will include all expenses of the voyage as well as those of the cargo, ports and fuel.

In this section, we will limit ourselves to the principle components of Vessel Cost Calculations. These expenses are all calculated on an annual cost basis and are expressed on a cost per operating day as well as on an annual basis.

The Daily Vessel Cost Calculation for the designated container vessel is shown in Exhibit 13. All costs have been expressed in U.S. dollars. The number of operating days used is 358 per annum, being 365 days less 14 days for biennial drydocking.

2.2 Crewing

As explained in Chapter 6, the size of the crew for our British flag container vessel and the wages used are based on indications provided to us by a British shipowner as the current cost of filling the various ship positions. This cost includes overtime, leave, fringe benefits, sick leave, pensions, social security, redundancies, etc.

As shown in Chapter 6, the various rates of pay as per contractual agreements between the employers' body and the various unions representing employees were considered. The figures provided to us by the General Council of Shipping as the industry average were also calculated. We have therefore used the cost which in our opinion is closely related to current costs. The crew breakdown and cost as per Exhibit 12 is Ŀ546,000 (Sterling) or U.S.$709,800. Also added to the figure is the cost of medical expenses of the crew and cost of crew changes resulting in a total crewing cost of US$752,700.

7.3 Insurance

The main insurance components are hull and machinery, P.I., war risks and insurance deductibles.

7.3.1 Hull and Machinery

In developing an insurance premium for the designated vessel, a certain amount of difficulty was encountered. Underwriters are reluctant to quote figures adhoc on a hypothetical basis as premiums depend on the experience of the shipowner, the age of the ship, size of the fleet, trading limits, flag, claims record and size of deductible.

In the process of developing some cost indications, we contacted mutual associations, underwriters, brokers and shipowners and consulted various studies. This resulted in narrowing the hull rate down to between .54 and .66 of one percent. We have assumed a hul rate of .60 of 1% with an insurance deductible of US$25,000 for each occurrence.

This insurance, for coverage for hull and machinery including total loss, collisions and other marine perils is based on value of vessel; therefore, any variance in vessel's capital value would affect the premium. Therefore, $37,400,000 x .006 = US$224,400. Working the premium from another source resulted in the following calculation:

Total Loss Rate: .3 of value plus Formula Deadweight of vessel at US$2.35 per ton

Formula Deadweight:

$$\frac{\text{Length B/P 220 m. x 31 m. breadth x 16 m. M. Depth}}{2.265} = 48{,}176.6 \text{ tons}$$

Hull value: $37,400,000

T.L.O. Rate @ .3 =	$112,200
F. Dwt 48176.6 @ $2.35 =	113,250
Total premium	$225,450

We have used $225,000 in our calculations.

7.3.2 Protection and Indemnity (P&I)

This covers the risks encountered by being a shipowner and will include such risks as damage to wharves, third party damage, loss of life, injury claims, repatriation of distressed seamen, cargo damage due to improper navigation or wrong delivery of cargo, cost of raising wreck, etc.

This cover is available through Protection and Indemnity Associations (P&I Clubs) being mutual clubs which are maintained by way of a levy on the amount of tonnage owned by its members and entered into the club, each making his proportionate payment to the club funds. Supplementary calls are made periodically to replenish funds when substantial claims have to be met.

Obtaining rates or premiums from each club is not easy. Their claims experience varies, shipowners tend to place their fleet in a club and costs will vary. Again, rates will depend on the owner's track record, his fleet, age of ships, flag and claims experience of that particular club. Premiums tend to be based on the G.R.T. of the vessel. These range from $1.00 to $2.20 per G.R.T. with a deductible of $5,000 for each occurrence for cargo and $1,000 for each occurrence on crew risks. Total annual cost: U.S.$62,000. This premium does not vary with value of vessel.

7.3.3 War Risks

This insurance is for coverage on war risks, civil strife, and commotions, strikes, etc. and this cover is obtained separately from mutual underwriters specialising in this type of risk cover.

Premium is based on vessel's value. We have estimated a rate of .05 of 1% or approximately $19,000 per annum with no deductible.

7.3.4 Deductible Provision

We have allowed on an annual basis a provision for deductibles that may arise from claims under hull cover and P&I: Total - US$31,000.

7.4 Repairs and Maintenance

This is an estimate of an annual provision to cover the costs of engine maintenance, hull maintenance and accrual for biennial drydocking and voyage repairs. This cost tends to range from 10.5 to 19.9% of the operating cost but for a new vessel such as our designated vessel, the cost is more likely to represent around 15 1/2%.

We have assumed a cost of US$165,000 for biennial drydocking and US$110,000 for other repairs and maintenance, making a total of $275,000 per annum.

7.5 Stores, Spares and Supplies

This covers the cost of engine room spare parts, catering stores, deck stores (ropes, paint, etc.), and other supplies required by the ship.

The breakdown of costs was developed after consultations with various sources and from experience and generally represents about 6.5% of the operating costs.

7.5.1 Lube Oil

This is a significant item of expense and covers the cost of lubricants on an annual basis. We have developed the following assumption:

Annual consumption: 38,000 gallons
Basis: 6.5 gallons per hour (80% of rated b.h.p. and auxiliaries over 13 voyages)
Price: U.S. $3.85 x 38,000 = U.S.$ 146,300 per annum.

7.5.2 Victualling

This covers the cost of feeding the crew and is expressed as a cost per man per day. Current cost on British flag ships is Ł2.80 per man per day (Ł2.80 x 365 x 28 men) = Ł28.616 per annum or U.S.$ 37,200.

This component of expense represents approximately 2 to 2 1/2% of vessel's operating costs.

7.5.3 Other

Cost figures have been calculated from industry sources and actual operating costs.

7.6 General and Administrative Expenses

This is the cost strictly related to the management of the vessel from a shipowners point of view and does not include the cost of selling or marketing of the ship services, but strictly of managing and other administrative expenses connected with the operation of the vessel. Various shipowners sometimes opt for having their ships managed by a ship management company who undertake all the ship managing and administrative tasks, including provision of technical services.

We have developed costs from indications obtained from a ship management company as well as from costs developed in previous studies and various industry sources.

These costs represent just over 6% of the total vessel operating cost or $110,000.

7.7 Vessel Operating Cost

As can be seen in Exhibit 13 the cost of operating the vessel is $1,777,900 per annum. This is the running cost of the ship excluding capital, finance cost and fuel. On the basis of 358 operating days per annum, this represents a daily vessel running cost of $4,966.00 per day.

7.8 Capital Cost of Vessel

This component is for the recovery of the capital cost of vessel plus financing cost. As discussed in Chapter 6, the capital cost of the vessel is as follows:

Ice strengthened container vessel	US$37,400,000
Financing cost*	14,810,000
Total cost of ship	US$52,210,000

*Financing cost based on 80% shipyard finance package at 7 3/4% over 8 1/2 years plus equity financing of 20% of capital cost at 13% over 8 1/2 years.

Amortisation rate has been taken over the life of the ship; that is straight line over 15 years or $3,480,667 per annum or $9,723 per day.

7.9 Capital Cost of Container Equipment

This component we believe is an integral part of the container vessel and, as discussed elsewhere, three sets of containers are required per ship for the service. We have allocated the capital cost of the three sets, together with the financing cost, to the vessel as follows:

Capital cost of 3 sets of containers for one ship	$13,704,000
Financing cost*	6,166,800
Total cost of equipment	$19,870,800

*Financing cost: 10% over 8 1/2 years on total purchase price of $13,704,000 on 4,020 boxes (5,400 T.E.U.s).

Amortisation rate on the equipment has been calculated on the life of the containers, 10 years straight line or US$1,987,080 per annum or $5,550.5 per day.

7.10 Total Operating Costs

(incl. cost of ship and containers)

This has been calculated at US$7,245,647 per annum, or $20,239 per day.

The most significant component in this cost is the capital cost of the vessel. If the cost of a new vessel was to be reduced to, say, $29,000,000 with financing arrangements at similar terms (see Exhibit 15), the cost and amortisation rate would be:

Capital Cost $29,000,000 + Interest Cost $11,485,000 = $40,485,000

Amortisation Rate: $2,699,000 per annum over 15 years or $7,539 per day.

Resulting in a Total Vessel Operating Cost of $18,056 per day.

7.10.1 Second Hand Vessel

Should a second-hand vessel be substituted for a new construction, this would significantly reduce the capital component, with the container equipment cost remaining the same and the operating cost of the vessel virtually remaining the same, with the exception of the insurance cost which would be somewhat reduced.

Exhibit 13

DAILY VESSEL COST CALCULATION

Designated Vessel

Service Speed: 17 kts
Consumption: 50 tons + 2 1/2 tons OMD
G.R.T. 31,000
Capacity: 1800 T.E.U.
Operating days: 365 - 7 (14 days biennial)
Repairs: 358 service days

	Yearly US$		Daily US$
Crewing			
Crew	709,800		
Crew changes	42,900	752,700	2,103.0
Other medical			
Insurance			
Hull & machinery	225,000		
P&I (incl. supplementary calls)	62,000	337,000	941.0
War risk, strikes	19,000		
Deductible	31,000		
Repairs & Maintenance			
Drydocking provisions (half of biennial)	165,000	275,000	768.0
Voyage, running & other maint. provisions	110,000		
Stores & Spares & Supplies			
Deck spares	20,000		
Engine	13,000		
Spares, incl. transport	61,000		
Lube oil	146,000	303,200	847.0
Catering supplies	17,000		
Victualling	37,200		
Water	9,000		
Other			
General Admin. & Other			
Management	90,000		
Rentals	3,500	110,000	307.0
Communication	3,500		
Sundries	13,000		
Vessel Operating Costs		$1,777,900	$4,966.0
Capital Annual Vessel Amortisation Rate*		3,480,667	9,723.5
Capital Containers+		1,987,080	5,550.5
Total Cost, incl. Capital	US$	7,245,647	$20,239.0

* Straight line over 15 years
+ straight line over 10 years.

Exhibit 14

VESSEL OPERATING COSTS

Expressed in % terms

	H.P.Drewry		Acres Study	Harrisons Clyde	UNCTAD/IMCO	
	1982 Costs T/D decker* N.European	Bulker* 59,000	On Ice strengthened Vessel-1982	1984	Yemen Shipping 1979	Designated Vessel
Crewing	51.1%	58.4%	36.9	45.0	46.1	42.3%
Insurance	7.8	10.2	21.6	16.1	18.4	19.0
Repairs & Maintenance	19.9	10.5	17.4	15.7	15.2	15.5
Stores, Supplies, Spares & Lubes	16.9	10.0	15.7	17.3	15.9	17.1
General Administration	4.3	10.7	21.6	5.8	4.4	6.2
Total Cost	$1,780,000	$1,715,000	$2,897,000	£1,339,000	$1,735,000	$1,777,900

* Older vessel.

DESIGNATED VESSEL

RE-CALCULATION OF SHIP FINANCING COST BASED ON REDUCED CAPITAL COST OF US$29 MILLION

Payment No		Principal	80% Loan 7 3/4% Interest			Equity	20% Equity 13% Interest			TOTALS
			Principal Payment	Interest Payment	Total Payment		Equity Payment	Interest Payment	Total Payment	US Dollars '000
Delivery		$23.200				$5.80				
6 mo.	1	21.835	1.365	.899	2.264	5.459	.341	.377	.718	2.982
1 yr	2	20.470	1.365	.846	2.211	5.118	.341	.355	.696	2.907
1 1/2	3	19.105	1.365	.793	2.158	4.777	.341	.333	.674	2.832
2	4	17.740	1.365	.740	2.105	4.436	.341	.311	.652	2.757
2 1/2	5	16.375	1.365	.687	2.052	4.095	.341	.288	.629	2.681
3	6	15.010	1.365	.635	2.000	3.754	.341	.266	.607	2.607
3 1/2	7	13.645	1.365	.582	1.947	3.413	.341	.244	.585	2.532
4	8	12.280	1.365	.529	1.894	3.072	.341	.222	.563	2.457
4 1/2	9	10.915	1.365	.476	1.841	2.731	.341	.200	.541	2.382
5	10	9.550	1.365	.423	1.788	2.390	.341	.178	.519	2.307
5 1/2	11	8.185	1.365	.370	1.735	2.049	.341	.155	.496	2.231
6	12	6.820	1.365	.317	1.682	1.708	.341	.133	.474	2.156
6 1/2	13	5.455	1.365	.264	1.629	1.367	.341	.111	.452	2.081
7	14	4.090	1.365	.211	1.576	1.026	.341	.089	.430	2.006
7 1/2	15	2.725	1.365	.158	1.523	.685	.341	.067	.408	1.931
8	16	1.360	1.365	.106	1.471	.344	.341	.045	.386	1.857
8 1/2	17	-0-	1.360	.053	1.413	-0-	.344	.022	.366	1.779
Total			23.200	8.089	31.289		5.800	3.396	9.196	40.485

Amortisation rate: $2,699,000 per annum over 15 years.

Exhibit 15

CHAPTER 8

PORT & CARGO HANDLING EXPENSES

8.1 Definition and Allocation

This will serve to explain the allocation of costs prior to identifying and quantifying the various elements of expenses incurred at the ports by the designated vessel.

All expenses incurred at a port are segregated into two main elements: Port expenses and cargo expenses. All expenses associated strictly with the vessel at the port are called port expenses. These cover such items as pilotage, harbour dues, berthing dues, tugs, customs, etc. The total incurred is expressed as cost per call. All expenses incurred at the port but associated with the handling of cargo are known as cargo expenses and are generally expressed either as a cost per ton or cost per T.E.U. We will show it as a cost per call when shown in the "Estimate of Voyage Expenses" - Exhibit 21. We will define and attempt to identify and quantify all main items of expense that fall within each of these categories for our two designated ports.

8.2 Port Expenses - Montreal

The total port expenses calculated for the designated vessel are shown on Exhibit 16 on a cost per call basis. It will be noted that two items, namely Pilotage and Tugs, are charged differently during winter months, these individual charges being double. This results in a cost per call during the winter months of $37,707 and $25,057 for the balance of the year.

The bases of the port charges are shown in Appendix D. However, by way of explanation, the following are the bases of our calculations:

Exhibit 16

TOTAL PORT EXPENSES - MONTREAL

Vessel: 31,000 G.R.T. Draft: 10.5 meters Time in port: 72 hours

		Cost per call $Can	Cost per call Winter
Pilotage:	In	4,996	$ 19,987 *
	Out	4,997	
Tugs:	In	1,328	$ 5,312+
	Out	1,328	
Handling Lines		1,737	
Habour Dues		1,206	
Dockage		4,402	
Shipping Federation Dues		225	
Agency Fees		3,788	
Other			
	Port Warden	500	
	Customs	100	
	Garbage Collection	50	
	Electricity	200	
	Fresh Water	200	
		$25,057	$37,706

* 2 pilots

+ Rates double January-March

8.2.1 Pilotage

St-Lawrence pilotage charges are levied by district, with the rate for each district being charged per pilotage unit and a separate rate per time factor unit.

Pilotage unit = Breadth^2 X Depth ÷ 100
Time Factor = Draft x Steaming hours

The designated vessel will incur charges for the two pilotage districts:

District I:

$14.09 per pilotage unit x 153.76 = $2,166.48
$6.78 per Time Factor x 126 = 854.28
$3,020.76

District II:

$9.54 x 153.76 = $1,466.87
$4.85 x 105.00 = 509.25
$1,976.12

Cost for each leg: $4,996.88

8.2.2 Tugs

These charges are based on cost per tug ordered, either 12 hrs or more in advance or a different rate applies if tugs are ordered with less than 12 hrs notice.

We have assumed that the tugs will be ordered 12 hrs or more in advance with the vessels always sailing around the same time as does happen with liner vessels on fixed schedules. We have also applied it with rate applicable to the stretch of the river where the Container Terminal is situated. The designated vessel will use two tugs for berthing and two tugs when sailing. This cost would be $664 x 2 = $1,328 in and $1,328 out. During January to March, the rate is double.

8.2.3 Handling Lines

As per Appendix D. We have calculated a cost of $1,737 using two different time periods for arrival and departure.

8.2.4 Habour Dues

These are levied on a rate per G.R.T. of 3.89¢ resulting in a cost of:

31,000 G.R.T. x 3.89¢: $1,205.90.

8.2.5 Dockage Dues

These are levied on the time period that the vessel utilises the berth with the rate per G.R.T. applied on periods of 12 hours.

For our calculation, we have assumed a total period of 72 hours made up as follows:

1st 12 hours 3.22¢ x 31,000 G.R.T. =	$ 998.20
2nd 12 hours 3.22¢ x 31,000 G.R.T. =	998.20
Subsequent 12 hr periods 1.94¢ x 31,000 G.R.T. x 4 =	2,405.60
Calculated Cost per 72 hours =	$ 4,402.00

8.2.6 Shipping Federation Dues

Levied on all vessels; we have used the maximum rate of $225 per call.

8.2.7 Agency Fees

As per Appendix D. We have assumed that the line appoints an agent to handle the vessel in port. The charge is levied on the cargo handled; we have assumed that vessel will handle in excess of 20,000 tons. This gives a rate of $2,525 discharge and $2,525 for loading less 25% = $3,788 per call in total.

8.2.8 Other

We have estimated the cost for Port Warden, Customs, Garbage Collection, Electricity and Fresh Water based on average costs incurred. Though these may vary from call to call, the cost is not significant.

8.3 Port Expenses - Felixstowe

The total Port Expenses estimated to be incurred on a cost per call basis is shown on Exhibit 17. We have estimated a stay in port of 24 hours. In our total cost, we have estimated that light dues are incurred on each call. The bases of the port charges where available are shown in Appendix E. The bases of our calculations are shown in the following explanations.

8.3.1 Pilotage

This is based on two charges, a rate for the shipping of the pilot, which is a flat fee plus a surcharge consisting of a permutation of the tonnage and the draft rate. We have used the maximum rate for the surchage, which at 31 ft draft or 9.45 meters is £304.89 plus the flat fee of £233. This covers pilotage to or from the berth to the sunk pilotage zone. Extra charges are incurred if it has to anchor to await the tide or awaiting berth; we have estimated an extra charge of £60, making a total cost of £600 in and £600 out. This figure may err on the high side in that extra charges may not always be incurred.

8.3.2 Tugs

The rate for the use of tugs is based upon the length of the vessel and the number of tugs used. We have used the rate applicable for a vessel in excess of 220 meters, the designated vessel being 230 meters and the use of two tugs in and two tugs out at £ 1,000 per tug, plus a charge for the use of the tugs lines of £11 per line. Total cost in and out: £4,044.

8.3.3 Handling Lines and Mooring

There are two charges, mooring and unmooring, which are based on rates set per length of ship and running lines based on a unit cost. The cost for mooring and unmooring for a vessel in excess of 200 meters but under 240 meters at the container terminal is £374.29 plus running lines of 107.59x2. This results in a total cost per call of £589.47 or £600 rounded.

8.3.4 Harbour Dues

This cost is assessed by the Harwich Conservency Board and is payable by all vessels on entry to the harbour. The charge is based on two rates: Surcharge 'A' levied on all vessels berthing at the various terminals within the port. Surcharge 'B' levied on all vessels in excess of 20,000 G.R.T.

The cost of conservancy dues for the designated vessel are:

'A' 31,000 G.R.T. @ 7.36 p. =	£2,281.60
'B' 31,000 G.R.T. @ 7.00 p. =	2,170.00
Total cost per call	£4,451.60

8.3.5 Dock or Berthing Dues

These are assessed by the container terminal operator and form part of the cargo expenses. The terminal operator may sometimes include it in his container box rate.

8.3.6 Light and Buoyage Dues

This charge is assessed on all vessels entering United Kingdom ports and is for the upkeep of navigational lights and buoys, in and around the United Kingdom Coast. The basis of the charge is the Registered Tonnage of the vessel (N.R.T.) plus a charge on deck cargo and fuel in ships double bottom. These dues are collected by H.M. Customs, acting as agents for the collection of dues on behalf of the Corporation of Trinity House. The deck cargo assessment is based on the volume of space occupied on deck by containers and is divisible by 100 cu.ft. to obtain tonnage. We have calculated an estimated deck cargo of 5,500 tons at 29p. x 18,000 N.R.T. This results in a total cost of £6,830 per call.

There is a ceiling on the number of payments made by the same ship within the year. This we understand is a total of 7 times on foreign trips and 14 times on Home Trade Limits. Our designated vessel makes an estimated 12-13 calls per annum.

8.3.7 Other

We have estimated an agency fee of Ł250 and the other charges on estimates based on some actual sample charges.

8.4 Port Expenses - Other Ports of Designated Route

We have not been requested by the client to identify and examine port expenses at Antwerp, LeHavre and Hamburg. It was suggested we use the costs determined at Felixtowe.

For purposes of our voyage calculations, we used a rounded cost per call for port expenses of Ł17,500 for each of those ports. We understand that this is on the high side.

Exhibit 17

TOTAL PORT EXPENSES - FELIXSTOWE

Vessel - 31,000 G.R.T. Draft - 10 meters Time in Port - 24 hrs Max

	£ Sterling.
Pilotage	
In:	600
Out:	600
Tugs:	
In:	2,022
Out:	2.022
Handling and Mooring	600
Harbour Dues	4,452
Light Buoyage Dues	6,830
Agency Fees	250
Other:	
Customs	25
Fresh Water	50
Miscellaneous	25
TOTAL PORT EXPENSES PER CALL	£17,476

8.5 Cargo Expenses

Cargo expenses are the most significant and costliest item in the operation of a container ship. This operation is always carried out at a Container Terminal where adequate container stacking space exists, where there exists at least two Portainer cranes, transtainers, front end loaders, trailers, and an experienced labour force. We have assumed the use in Montreal of a facility such as the Racine Terminal with steady productivity levels.

Productivity of containers impacts on both the cost and the turnaround times.

8.5.1 Montreal Total Cargo Expenses

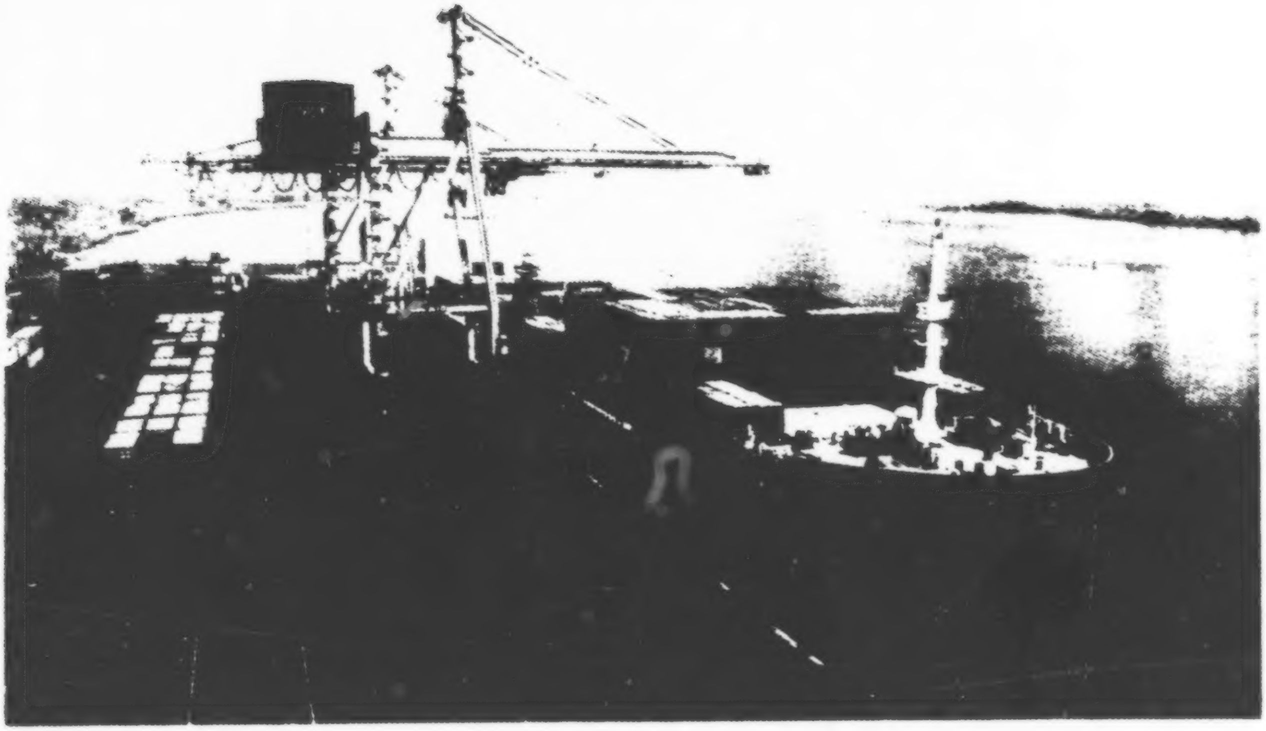
The principle elements of container handling costs are: container box rate, overtime differential, lost time and detention, extra labour charges, securing, wharfage, MEA assessments and Port of Montreal rail switching charges.

Each of these identified elements of expense are dealt with in detail in section 5.2. In calculating the cost of cargo handling expenses, the following assumptions have been made for the designated vessel.

Containers: 1800 TEU's in and the same out, this equates to 1350 boxes in and same out, made up of: westbound 1350 full boxes and eastbound 950 full boxes plus 400 empty boxes. The distribution of box types in both directions has been assumed to be 840 x 20 ft containers, 60 half height, 20 reefer and 430 x 40 ft containers.

Time in port: 72 hours working round the clock with a productivity of 20 boxes per crane hour.

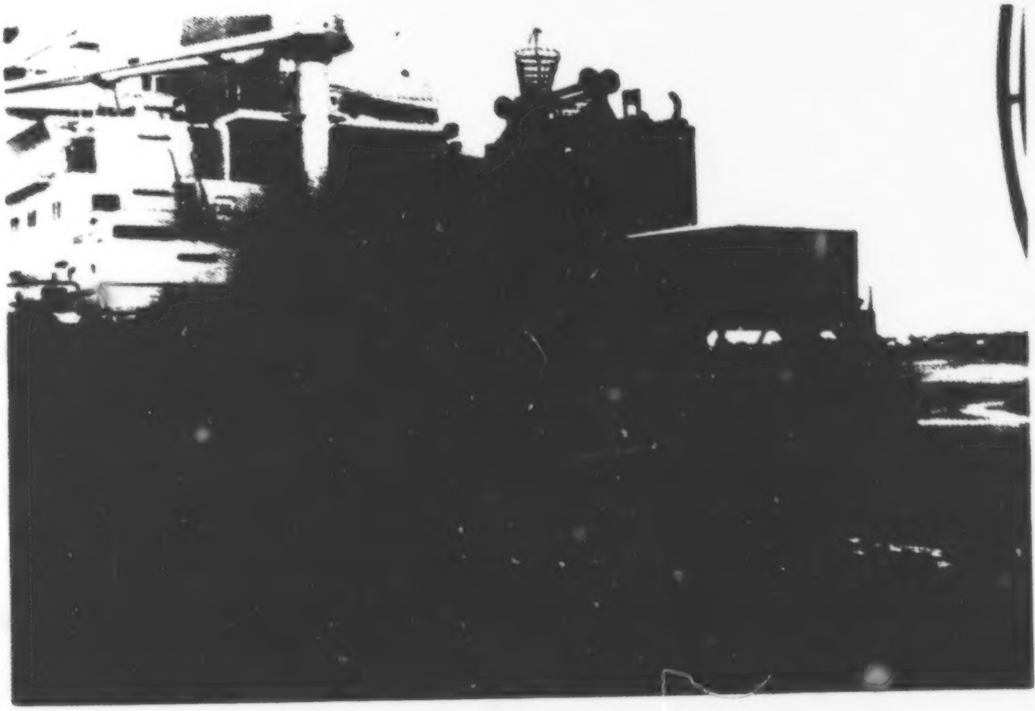
The total cost of discharging and loading our designated vessel is shown in Exhibit 18 where all the elements of expense have been identified and costed for the total operation at the port.



Container Terminals - Montreal

CP Ships
CP Ships

Handling Containers - Montreal



8.5.2 Basis of Cargo Handling Calculation

8.5.2.1 Container box rate: terminal charges for the handling of containers are on a box rate. The box can be either a 20 ft, half height, or a 40 ft reefer container. The negotiated box rate is fixed and remains the same whether the container is full or empty. Stevedoring/terminal operators are somewhat reticent in revealing the actual box rate negotiated with their various clients. The business is highly competitive and rates are dependent upon guaranteed annual container volume. The rate generally covers working during straight time hours on week days with an overtime differential penalty being charged for overtime work. The rate covers handling the box in and out of the terminal, on or off the ship from, or to a trailer or railcar.

On the productivity level of 20 boxes per hour, the box rate per crane gang hour has been estimated to be $150.00 per box. This figure was felt to be reasonable and close to the average actual, by industry sources.

Gang or crane gang sizes tend to vary slightly from 16 to 20 men per gang. When working 2 cranes, the gangs will be between 30 to 40 men. The box rate will cover the crane, stevedore gang, plus a rail gang of 16 men and/or a truck gang of 11 men. The hourly charge out rate per man is $22.75 per hour + 10% for 1984 contract recently negotiated = $25.02. The total cost of handling the 2,700 boxes in straight time is therefore 2,700 x 150 = $405,000.

8.5.2.2 Overtime Differential Calculation

On the basis of 86 hours in port and 2,700 boxes, the total crane gang hours required to work the ship is:

2,700 boxes ÷ productivity 20 = 135 crane gang/hours.

As vessel will invariably work two cranes this would require a total of 67.5 hours to handle all the cargo, well within the 72 hours allotted to the port in her schedule.

Straight work: as the vessel will rarely arrive for an 8 a.m. start, we have assumed a loss in the straight availability on the first day and estimated a total straight time availability of 22 hours or 44 crane gang/hrs.

Overtime hours will amount to:

135 - 44 = 91 crane gang/hrs.

Work undertaken between 1600 - 2400 is at time and half and at double time between 0000 - 0800. We have assumed 48 gang hours at time and half, and 43 gang hrs at double time.

The cost differential per gang hour is calculated as follows:

16 men @ $22.75 + 10% = $400	Straight time
16 men @ $32.74 + 10% = $577	Time and half diff.= $177 per g/hr
16 men @ $42.03 +10% = $740	Double time diff. = $340 per g/hr.

* 1984 increase

Cost of overtime differential:

48 hrs x $177 =	8,496
43 hrs x $340 =	14,620
Stevedores overtime cost	$23,116

Rail Gangs: Straight time cost of this group is covered in box rate. These men handle the containers incoming or outgoing from rail cars to container stack to be loaded on ship or from stack to railcars.

We have assumed that these men will incur overtime in the same proportion as the other labour, even though in practice they may be called prior to vessel's arrival to stack the containers prior to the vessel's arrival. This assumption in terms of overtime cost was felt to be reasonable by our industry sources. We have assumed one gang performing:

24 hrs @ time and half @ $177 =	$4,248
21 hrs @ Double time @ $340 =	7,480
Rail gang overtime cost	$11,728

8.5.2.3 Lost Time and Detention

Lost time expense is incurred when the labour have been ordered and are unable to work due to weather delays, or vessel is delayed or awaiting lashings to be removed from the secured deck containers. The cost is generally the gang cost plus a 5% premium. Detention is incurred when a malfunction occurs either with crane or on ship; this incurs a 20% premium on the gang cost. Generally, lost time represents around 2/3rds of delays with 1/3rd being for detention. This results in an average premium cost of 10%. On average, lost time and delays represent around 5% of the total gang hours incurred (180 g/hrs) or approximately 9 gang hrs.

Lost and detention delays = 9 g/hrs x $400 + 10% = $3,960

8.5.2.4 Extra Labour

Container box rates cover the cost of two movements from rail or trailer to stack and from stack to ship and vice versa. If for any reason more than two lifts are required, then extra charges are incurred. This happens if a container is damaged or if a container is set aside for lack of documents or held back for another sailing. This is not a significant charge but can amount on average to about 3% of number of boxes discharged. We have assumed a charge of $25.00 per box X 40 boxes= $1,000.

8.5.2.5 Securing

This expense is incurred on all container vessels and involves the securing or lashing of all the deck containers. On a container vessel of the designated size, some 50% of her TEU capacity is stowed on deck. Vessels coming in will sometimes have the lashings removed by the crew on the way up the river, but that varies from ship to ship and upon the crew as well as on weather. The securing of containers is always done by shore labour carpenters, and this is done on completion of the deck load over the hatches. The number of men required will depend on the timing of each section; however, in general, this task is invariably undertaken in overtime hours. After discussions with industry sources, we have estimated the following:

16 men x 16 hrs = 256 manhours at time and half.

The cost of securing labour is the applicable overtime rate plus 20% premium.

Therefore: $36.01 x 256 + 20% = $11,062.

8.5.2.6 Switching Charges

This expense covers the cost of handling containers from the rail interchange point of CP and CN to the container terminal. This is levied by the Port of Montreal and is assessed on loaded containers only on the number of rail cars used for movement within the port area.

It is estimated that approximately 80% of cargo for the designated route is handled by rail. A rail flat car can take 4 x 20 ft containers or 2 x 40 ft at a cost of $33.13 per car.

Westbound: 1350 full boxes or 1800 TEU x 80% = 1440 TEU ÷ 4
= 360 rail cars @ $33.13 = $11,927.00.

Eastbound 950 full boxes or 1264 TEU x .80 = 1011 ÷ 4
= 253 rail cars @ 33.13 = $8,375.

Total estimated cost for rail switching: $20,302.00

8.5.2.7 MEA Assessments

This charge is assessed on cargo and paid to the Maritime Employers Association (Shore Labour) to cover job security and administration. The rate is shown in Appendix D and is $3.47 per tonne.

Eastbound:	950 boxes x 15 ton. x $3.47 =	$49,447
Westbound:	1,350 boxes x 15 ton. x $3.47 =	$70,268
Total MEA Assessments:		$119,715.

8.5.2.8 Wharfage

This charge is assessed by the Port of Montreal on the container line on all cargo going over the quay on a tonnage basis.

Earlier, we indicated that the average weight per box aggregated is 15 M/tonnes. The rate assessed is $2.25 per tonne:

Inward:	1350 boxes @ 15 ton. @ $2.25 =	$45,563
Outward:	950 boxes @ 15 ton. @ $2.25 =	$32,062
Total wharfage cost:		$77,625

Although aspects of revenue on freight rates are not within the scope of this study. Wharfage is generally collected from the shipper by way of a wharfage charge over and on top of the freight rate. As the container line is assessed the charge by the Port, we prefer to have it as part of cargo expenses - and thus gross cost - with the amount collected added to revenue as with bunker surcharge, etc.

Exhibit 18

CARGO HANDLING EXPENSES - MONTREAL

Cargo - 1350 boxes In full; Out 950 boxes full + 400 M.T.
Total in & out: 2,700 boxes or 3,600 T.E.U.

		$Can.
Container Box Rate		
	In: 1,350 @ $150 = $202,500 Out: 1,350 @ $150 = $202,500	$ 405,000
Overtime Diff. Load/Discharge		
	Stevedores (Crane Gangs) $23,116 Rail/Track Gangs $11,728	$ 34,814
Lost Time & Detention		3,960
Extra Labour		1,000
Securing		11,064
Wharfage		
	In: $45,562.5 Out: 32,062.5	77,625
M.E.A.		
	In: $70,268 Out: $49,447	119,715
Rail Switching Charges		
	In: $11,927 Out: $8,375	20,306
	TOTAL CARGO EXPENSES	$ 673,484

Cost per box incl. empty container: $249.44

Cost per T.E.U.: $187.08

8.6 Cargo Handling Expenses - Felixstowe

The total cost for handling containers at the port of Felixstowe is shown in Exhibit 19. This covers the first call of the vessel at the port with 650 boxes. The cost of the second call is based on the prorated cost established in Exhibit 19. The main elements of the cargo expenses are: container box rate, overtime differential, holiday premium, lost time, securing, extra labour and berthing dues. The basis of some of these expenses are shown in Appendix E. The following will explain the basis of our calculations.

8.6.1 Container Box Rate

Container box rates are subject to negotiations between the container line and the terminal operator. These rates are not published. The rate agreed will be dependent upon various factors:

a) Volume, and minimum annual throughput

b) Whether rate is an all inclusive one or if it includes overtime, hire of equipment, berthing fee, etc.

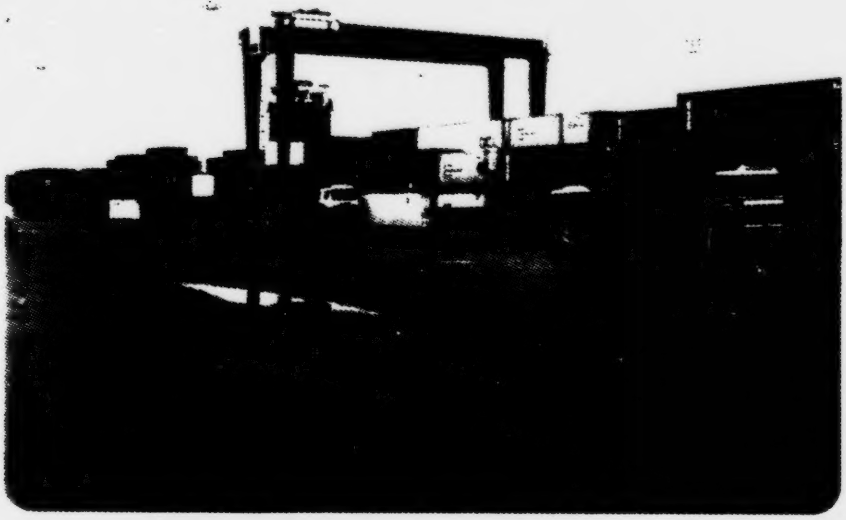
The box rate covers load or discharge of containers empty or full, 20ft, 40ft or half height, receiving in terminal, storing up to 7 days and loading. The rate will be based either on a 3 shift weekday or 2 shift weekday system with an overtime differential depending on which terminal is used, i.e. Dooley, Landguard or Walton. Box rates will vary from £45 to £90 depending what it covers. For the purposes of our designated vessel, we have assumed a weekly service with the vessel making two calls, once for discharging thence returning to load a few days later to load for the Westbound voyage. We have also assumed a volume of 650 boxes in and 550 boxes out. The box rate in this case has been estimated to be £80 per box covering a 2 shift weekday system, with berthing dues assessed separately. Productivity average rate 20 boxes per crane-hour. Gang size will be 27 men for 2 crane gangs.

The total box rate handling cost is:

650 boxes x £80 = £52,000

Port of Felixstowe

Container
Terminal
- Felixstowe



Port of Felixstowe

Container
Terminal
- Felixstowe

8.6.2 Overtime Differential Calculation

Estimated average productivity is 20 boxes per hour per crane:

650 boxes ÷ 20 = 32.5 crane hours required to discharge Felixstowe boxes

If vessel works two gangs, time required for discharge will be 16 1/4 hrs. We have assumed a stay in port of 24 hrs, made up of 18 hrs to work cargo, plus two hrs delays and 2 hrs berthing and pilotage in and out. The box rate covers 16 hrs at straight time with the third shift chargeable at £150 per crane gang/hour on weekdays 0000-0800 minimum charge 4 hours, and on weekends 0000-1600 Saturday minimum 8 hrs, 1600 Saturday to 0800 Monday £197.00 per crane gang hour and £250.00 per crane gang hour for holidays.

We have estimated 16 crane gang hrs at time and half or at £150 per gang = £2,400.00. This we feel is a conservative estimate especially when viewed that the box rate covers 16 hrs in straight time on weekdays. On the other hand, some weekend work will be incurred depending on the cycles of the frequency in the schedule on arrival and sailing days.

Holiday Premium Allowance: Due to the very high costs of holiday work and the occasions on which these will be incurred in the course of the vessel's scheduled calls at the port, it was felt that some allowance should be made for them.

We have assumed that work will be incurred on a total of four public holidays in the course of the vessel's 26 calls (13 East and 13 West).

Cost of holiday work: 32.5 crane g/hours @ £260 per hour = £8,450

Extra cost of holiday differential:

Normal overtime differential cost £8,450 less holiday cost £2,400 = £6,050

Differential cost on annual basis = 6,050 x 4 = £24,200 or £930 per call

Therefore total cost of overtime differential and holiday premium = £3,300

8.6.3 Lost Time

This covers the cost of unproductive gang hrs due to late arrival of vessel, weather delays, awaiting deck containers to be unsecured and tidal delays. This tends to occur more often during winter months. The box rate covers the cost of labour supplied and being able to work the shift. If for some reason this cannot be done, then the terminal operator charges the cost of the labour to the ship or container line at the cost of £168 per gang hour. We have estimated a total of 4 gang hours on average per call for deadtime and lost time. This rate is for 0800 Monday to 0800 Saturday and £223 for all other times.

Therefore total cost of dead time and lost time is 168 x 4 = £672.0.

8.6.4 Extra Labour

We have estimated a cost of £500 to cover the cost of any extra labour charges. This could be incurred if boxes have to be lifted more than once on and once off or shifted or if damaged or any other extra work due to any special situation not envisaged during the course of normal working.

8.6.5 Securing

Cost of securing gang is £120 per hour. We have estimated 4 gang hours to cover the cost of unlashing and securing deck containers is £480.00.

8.6.6 Berthing Dues

This charge is assessed by the terminal operator and covers the cost of using the berth. That charge is sometimes added to the box rate. We have estimated a cost of £2,800.

Exhibit 19

TOTAL CARGO HANDLING COSTS - FELIXSTOWE

Cargo In: 650 Boxes (870 T.E.U.) Time in port: 24 hours

	Ł Sterling.
Container Box Rate Ł80 x 650	52,000
Overtime Differential and Holiday Premium	3,300
Lost Time and Detention	670
Extra Labour	500
Securing	500
Berthing Fee	2,800
TOTAL CARGO HANDLING COST	Ł59,770

Cost per box: Ł92.00 Cost per T.E.U.: Ł69.00

Exhibit 20

TOTAL CARGO HANDLING COSTS - FELIXSTOWE - 2nd CALL

Cargo Out: 550 Boxes (735 T.E.U.) Time in port: 24 hours

Total Cargo Handling Cost: 550 @ £92 = £50,600

Cost per T.E.U.: £6,900

8.7 Cargo Handling Costs - Other Ports

The examination and identification of cargo handling costs at the ports of Antwerp, Hamburg, LeHavre were not undertaken as this was not required by the client. We have assumed that the cost for handling boxes would be equivalent to Felixstowe, that is £92 per box. We believe that the costs in those ports are not as high as Felixstowe.

For purposes of our voyage, calculation with respect to the cost of handling containers at the various ports, we have used the following:

	Cost per T.E.U.
Antwerp	
300 boxes In + 400 boxes out = 700 @ £92 = £64,400	£69
Hamburg	
200 boxes In + 200 boxes Out = 400 @ £92 = £36,800	£69
LeHavre	
200 boxes In + 200 boxes Out = 400 @ £92 = £36,800	£69

CHAPTER 9

VOYAGE EXPENSES

This section will devote itself to the calculation of the total voyage expenses expressed on a per voyage basis.

The main components are the daily vessel cost, time of vessel in port and at sea, fuel cost, cargo handling and port expenses at each port, each cost has been discussed in Chapter 8.

Exhibit 21 shows the "Total Voyage Expense Calculation" calculated in U.S. dollars. We shall briefly summarise on the individual components of expense.

9.1 Vessel Time Factor

We have calculated our steaming time on the basis of a service speed of 17kts to maintain the 28-day voyage cycle and scheduled sailings.

9.1.1 Sea Time

The various sea time calculations are as follows:

Montreal - Felixstowe	3230 nautical miles	or	7.92 days
Felixstowe - Hamburg	360 nautical miles	or	0.88 days
Hamburg - Antwerp	376 nautical miles	or	0.92 days
Antwerp-Felixstowe	138 nautical miles	or	0.34 days
Felixstowe-LeHavre	200 nautical miles	or	0.49 days
LeHavre-Montreal	3122 nautical miles	or	7.65 days
			18.20 days

It is normal to allow for delays and we have allowed a 5% delay on sea days resulting in a total of 19.11 days steaming time.

9.1.2 Port Time

We have calculated the following time in port allowing for berthing, unberthing, discharge, load, awaiting tides.

Montreal	3.5	days	handling	2700 boxes	
Felixstowe	1.0	days	handling	650 boxes	
Hamburg	0.75	day	handling	400 boxes	
Antwerp	1.25	days	handling	700 boxes	3600 T.E.U.
Felixstowe	0.83	days	handling	550 boxes	
LeHavre	0.75	days	handling	400 boxes	
Total time in port	8.08	days			
Estimated delays 10%	0.81				
Total Voyage Port Time	8.89	days			

9.2 Daily Vessel Cost Factor

This factor is shown on Exhibit 13. As previously explained, consists of three principle components:

Vessel Operating Cost	$ 4,966.0	per day
Vessel Amortisation Cost	$ 9,723.5	per day
Container Equipment Amortisation Cost	$ 5,550.5	per day
Total Vessel Cost per Day	US$20,239.0	per day

This daily vessel cost is used in our calculation of vessel's voyage cost resulting in a total vessel cost of:

28 days x $20,239 = $566,692.

9.3 Bunkering

The bunkering pattern for our designated vessel on her designated schedule calls for the vessel to bunker at Montreat for the round trip.

This is done concurrently with the working of the ship at the port she is in the longest and fuel prices at Montreal are generally cheaper.

The price we have used is that currently being paid by a shipping company. In many cases, prices vary and depend on the annual volume that a ship operator can guarantee. Therefore in our calculations we have used the following prices:

Intermediate Fuel Redwod 1800	US$ 184.00 per tonne
O.M.D.	US$267.00 per tonne

9.3.1 Fuel Cost Calculation

Fuel consumption for the designated vessel is 50 tons per day. Therefore, fuel cost =

50 x 19.11 sea days = 955.5 tons @ $184.00 = $175,812

Fuel for auxilliaries is at 2.5 tons per day x 28 = 70 tons x $267.00 = $18,690

9.4 Port Charges

These have been calculated in detail elsewhere. To summarise:

9.4.1 Port Expenses

Montreal	$25,057	@ .769 exch.	U.S.$ 19,275
Felixstowe	Ŀ17,476	@ 1.30	US$ 22,719
Hamburg	Ŀ17,476	same rate used	US$ 22,719
Antwerp	Ŀ17,476	for all European	US$ 22,719
Felixstowe	Ŀ17,476	ports	US$ 22,719
LeHavre	Ŀ17,476		US$ 22,719
			US$132,870

9.4.2 Cargo Expenses

				US$
Montreal	2700 boxes	@ $249.44	= $6734.84 =	518,047
Felixstowe	650 boxes	@ £92	= £59,770 =	77,701
Hamburg	400 boxes	@ £92	= £36,800 =	47,840
Antwerp	700 boxes	@ £92	= £64,400 =	83,720
Felixstowe	550 boxes	@ £92	= £50,600 =	65,780
LeHavre	400 boxes	@ £92	= £36,800 =	47,840
				$840,928

9.5 Container Maintenance, Repair & Insurance

As discussed in Chapter 5, the annual cost of the expense for the fleet is $3,437,040 or $66,097 per voyage (52 voyages per annum). We are of the opinion that this cost should be allocated on a per voyage basis in order to reflect this cost.

9.6 Positioning of Empty Containers

As previously discussed, this cost has been estimated at $80,000 per voyage.

9.7 Conclusion

All the above items cover all the principal elements of expenses expressed and allocated on a voyage basis. The resultant total cost may be on the high side in view of utilising Felixstowe costs for the ports of Hamburg, Antwerp and LeHavre which could be lower. However, the bigger factor is the capital cost of the ship which appears to be on the high side due to the very competitive climate prevailing in the shipbuilding industry. For example, should the vessel cost US$29,000,000, this would reduce the voyage cost to:

> US$1,829,965 or $508.3 per T.E.U. as a result of the reduction in Daily Vessel Cost from $20,239 per day to $18,056 per day.

Apart from ACL, none of the container lines in the trade are using new vessels and therefore their costs will tend to reflect the original cost of their fleet which is significantly lower than our estimated new construction cost.

The cost of selling, marketing, booking agents and advertising has not been evaluated or identified as it is not within the scope of this study. However, in order to complete the window on the industry, it should be studied and quantified.

In order to estimate the approximate cost of operating the fleet and the service on an annual basis, we can take the voyage cost and multiply by the 52 voyages a year.

Exhibit 21

VOYAGE EXPENSE CALCULATION

VESSEL: "DESIGNATED CONTAINER" **DATE:** October 1984

17 knots on 50 tons Int + 2 1/2 tons OMD

		STEAMING	IN PORT
	Montreal	-	3.50
	Felixstowe	7.92	1.00
	Hamburg	.88	.75
	Antwerp	.92	1.25
	Felixstowe	.34	.83
	LeHavre	.49	.75
	Montreal	7.65	-
		18.20	8.08
	Delays	.91	.81
28	Total Days	19.11	8.89

(Fixed Chgs)

Vessel Cost: 28 days - @ $20,239 per day $566,692

Fuel: Int. 1500 x 19.11 days @ 50 tons 955.5
OMD x 28 days @ 2.5 tons 70.0

955.5 @ $184 175.812
70.0 @ $267 18,690

PORTS OF CALL

	Port Chgs	Cargo Chgs
Montreal	$ 19,275	518,047
Felixstowe	22,719	77,701
Hamburg	22,719	47,840
Antwerp	22,719	83,720
Felixstowe	22,719	65,780
LeHavre	22.719	47,840
	$132.870	$840,928

ALLOCATIONS

Container Maintenance, Repair & Ins.	$ 66,097	
Positioning of Empty Containers	$ 80,000	
Sub Total	$278,967	$1,602,122
TOTAL VOYAGE EXPENSES		$1,881,089

Total Boxes: 2,700 Total T.E.U.: 3,600

Cost per box: $US$696.70 Cost per T.E.U.: $522.52

CHAPTER 10

CHARTER MARKET AND SECOND HAND VESSELS

10.1 General

In attempting to develop charter rate and second hand price indications for this section of the study, certain difficulties were encountered. These difficulties were attributable to limited budget and time, lack of direct access to the market and the absence of published or disclosed fixtures and sales prices for vessels of the designated size.

An attempt will be made here to identify the factors which impact on the market for this type of vessel.

10.2 Fleet

In the designated vessel size, the world fleet in July 1984, of fully cellular container vessels in the 1800-2000 T.E.U. range, amounted to 161 vessels with a capacity of 274,250 T.E.U.s, with a further 16 vessels on order having a capacity of 27,300 T.E.U.s. The growth in the fleet from January, 1983, to July, 1984, amounted to 26 vessels with a capacity of 48,300 T.E.U.s, an increase in the fleet of 19%. This vessel type tends to be built for dedicated container line services rather than for chartering out purposes, which tends to impact on the availability of tonnage (ships) on the market place.

10.3 Demand

The demand for the larger container vessel in this range has tended to be firm, with container lines seemingly upgrading and rationalising their services utilising the larger capacity vessels. This has resulted in little to no idle tonnage and a firm market.

10.3.1 Future Impacts

The present firm situation may change, due to the increase in capacity of world wide vessels on order, especially in the larger size vessel. For example, there are some 51 ships on order in the 2000 T.E.U. and over range, with an estimated capacity of 148,400 T.E.U.s; this represents an increase of 93.2% in that category of the current fleet.

The development and introduction by some major international container ship operators of ships of the very latest design and large capacity for the round-the-world container services, will impact on demand and availability of the second generation size vessels.

Another factor is the overrated Trans Pacific market where large scale new tonnage scheduled for delivery over the next two years will seriously imbalance the trade and result in tonnage being released and a softer market for ships developing.

A further factor that may affect the Trans Pacific container trades and thus tonnage, is the new regulations. The full effect of the U.S. (1984) Shipping Act will not become clear for several months as new agreements are established for shipments to and from the U.S.A.

10.4 Charter Rates

Charter fixtures in this segment of the market are not readily available, as they are generally executed on a confidential basis and not disclosed. Factors that will come into play when negotiating a rate with a shipowner are:

a) vessel's fuel efficiency - this tends to vary widely in this type of ship
b) trade the vessel will be engaged in;
c) length of the charter;
d) whether container operator is established and substantial - this impacts on the security of the agreement.

Bearing the above factors in mind, together with the reservations indicated, the estimated cost for a possible period of time charter of vessel for a period in excess of 12 months would be in the US$6 to $7 range per day per T.E.U. capacity or US$10,800-$12,600 per day excluding fuel and delivery/redelivery terms, for a ship of 1800 T.E.U. capacity.

With little overcapacity in the market, the ship that meets all of the container ship operator's requirements will command a premium.

Multipurpose type vessels can be fixed at a cheaper rate because these are not cellular vessels. That type of vessel is sometimes chartered to fill in during periods when the line's own vessels are undergoing refits.

10.5 Second Hand Ships

The same observation and comments which have been made on the charter market apply to the sale and purchase market. After discussions with shipbroker sources, a cost indication was developed of approximately $6,000 per T.E.U. capacity for a vessel built around 1978-79. This would result in a second hand cost for the designated vessel of US$10-11 million.

REFERENCES

1. "New building Ship Prices - 1976-1984", Fairplay International Research Services.

2. "Estimating Number of Sets of Containers for Container Ships", E.D. Edmond and A.J. Wright, R.I.N.A., 1977.

3. "Containers on the North Atlantic", University of Liverpool, S. Gilman, 1977.

4. "Lake Melville Winter Navigation Cost Study", Acres and Nordco, 1982.

5. "Management Assistance Study - Indonesian Govenment Fleet", World Bank, J. Bardelmeier & J. Balfour, 1981.

6. "Yemen National Flag Fleet Development", IMCO/UNCTAD, J. Balfour, 1979.

7. "Container Ships in their Transport Networks", S. Gilman, "North East Coast Institution of Naval Architects and Shipbuilders", 1983.

8. "1982 Ship Operating Cost Survey", Drewry Shipping Consultants, 1983.

OTHER

Shipping Statistics and Economics - Drewry Shipping Consultants
Fairplay International
Marine Engineering Log
Container News
Canadian Sailings
Financial Times (U.K.)
Port of Montreal

LIST OF SOURCES CONTACTED

Container Lines

St-Lawrence Co-ordinated Service
Canada Line
CAST
Hapag Lloyd (Montreal Shipping)
Sealand
A.C.L.
Polish Ocean Lines (Seabridge International Shipping)
Morflot Freightliners (Arctic Line and Balt-Canada Line)

Shipowners & Ship Managers

Bank Line - United Kingdom
C.P. Ships - United Kingdom
Federal Commerce & Navigation - Montreal
Harrisons (Clyde) Ltd. - United Kingdom

Terminal Operators & Stevedores

Felixstowe Dock & Railway Co. - United Kingdom
Walton Container Terminal - United Kingdom
Racine Terminal - Montreal
CeresCorp Inc. - Montreal
Port of Montreal
Port of Felixstowe
Port of LeHavre

Containers

C.T.I. Leasing
Conterm - Montreal
Cargo Systems - United Kingdom
Sally Sutton Overseas Services Ltd. - United Kingdom
Hyundai Heavy Industries Co. - Markham, Ontario

SOURCES CONTACTED

Shipbuilders

British Ship Builders Ltd. - United Kingdom
Hyundai Heavy Industries - S. Korea
China Shipbuilding Corp. - Taiwan

Insurance

Andrew Wier London Ltd.
United Kingdom Owners Protection & Indemnity Association
Thos. J. Bradshaw & Associates, N.Y. (Through Transport Mutual Insurance Association)
Marsh McLennan - Montreal
Shipowners Assurance Mutual - Montreal

Other

Fairplay Internationa Research Services - United Kingdom
Drewry Shipping Consultants - United Kingdom
National Maritime Board - United Kingdom
General Council of British Shipping - United Kingdom
Warden & Bell Shipbrokers - Scotland
Gibsons Shipbrokers - Montreal
Furness Withy Agency Ltd. - United Kingdom
Department of Trade - United Kingdom
The Shipping Federation of Canada - United Kingdom
Townsend Thorensen - United Kingdom
Port of Montreal

APPENDIX A

a) Container Vessels Delivered

b) Container Vessels on Order

c) Fairplay Hypothetical Container Vessel

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 CCCC   OOOOOO  NN    NN  TTTTTTTT     A     IIII  NN    NN  EEEEEE  RRRRRR
CC  CC  OO  OO  NNN   NN     TT       AAA     II   NNN   NN  EE      RR  RR
CC      OO  OO  NNNN  NN     TT      AA AA    II   NNNN  NN  EE      RR  RR
CC      OO  OO  NN NN NN     TT     AA   AA   II   NN NN NN  EEEEE   RRRRRR
CC      OO  OO  NN  NNNN     TT     AAAAAAA   II   NN  NNNN  EE      RR RR
CC  CC  OO  OO  NN   NNN     TT     AA   AA   II   NN   NNN  EE      RR  RR
 CCCC   OOOOOO  NN    NN     TT     AA   AA  IIII  NN    NN  EEEEEE  RR   RR

VV    VV  EEEEEE   SSSSS    SSSSS   EEEEEE  LL       SSSSS
VV    VV  EE      SS   SS  SS   SS  EE      LL      SS   SS
VV    VV  EE      SS       SS       EE      LL      SS
VV    VV  EEEEE    SSSSS    SSSSS   EEEEE   LL       SSSSS
 VV  VV   EE           SS       SS  EE      LL           SS
  VVVV    EE      SS   SS  SS   SS  EE      LL      SS   SS
   VV     EEEEEE   SSSSS    SSSSS   EEEEEE  LLLLLL   SSSSS

*  *  *   *  *  *   *  *  *   *  *  *   *  *  *   *  *  *   *  *  *   *  *  *   *  *  *   *  *  *
  ***       ***       ***       ***       ***       ***       ***       ***       ***       ***
*******   *******   *******   *******   *******   *******   *******   *******   *******   *******
  ***       ***       ***       ***       ***       ***       ***       ***       ***       ***
*  *  *   *  *  *   *  *  *   *  *  *   *  *  *   *  *  *   *  *  *   *  *  *   *  *  *   *  *  *

DDDDDD  EEEEEE  LL      IIII  VV    VV  EEEEEE  RRRRRR   EEEEEE  DDDDDD
DD  DD  EE      LL       II   VV    VV  EE      RR  RR   EE      DD  DD
DD  DD  EE      LL       II   VV    VV  EE      RR  RR   EE      DD  DD
DD  DD  EEEEE   LL       II   VV    VV  EEEEE   RRRRRR   EEEEE   DD  DD
DD  DD  EE      LL       II    VV  VV   EE      RR RR    EE      DD  DD
DD  DD  EE      LL       II     VVVV    EE      RR  RR   EE      DD  DD
DDDDDD  EEEEEE  LLLLLL  IIII     VV     EEEEEE  RR   RR  EEEEEE  DDDDDD
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PAGE   1                                                                                          11:07:14  27 JUN 1984

TYPE2 ....  DWT... COY SHIPYARD.. ...      CDO CARGO HANDLING GEAR.......... GRAIN. BALE.. REEFER VEHS CONTS PSSG N/B PRICE....... VTP 99

24765        6477 JAP SHINHAMA DKYD.  DK  0-1-30                    10387   9994                368      Y1.400            CV  75
29000       15789 D   WESER SEEBECK   D   0                                                      750      M40.000           CR  76
26144        6339 JAP YAMANISHI ZOSEN D   0-1-30                     9780   9191                358      Y1.700 99/99      CN  76
26143        6100 JAP YAMANISHI ZOSEN D   0-1-30                     9780   9191                358      Y1.700 99/99      CN  76
24767        6477 JAP SHINHAMA DKYD.  CB  0-1-30                    10387   9994                318      Y1.400            CV  76
27354        6600 JAP MIE ZOSEN       IL                                                         150      Y2.000 99/99      CN  76
27737        6600 JAP OKAYAMA ZOSEN   HK  0-1-39                                                 270      Y1.500            CN  76
26014       25500 JAP SASEBO HVY.IND. HK  0                                                     1588      Y8.500 70/07      CL  76
26152       30934 JAP I.H.I.          SNC 0                                                     1569      Y9.500 60/06      CL  76
26590        1200 N   FOSEN MEK V.    N                              4245   4174    566          40      N23.000           CP  76
26591        1200 N   FOSEN MEK V.    D                              4245   4174    566          40      N23.000           CP  76
26596        1200 N   BANKKESSJOEN    N   D-1-40,C-1-12              3705           538          22      N23.000           CP  76
26637        5650 SK  DAE DONG SB.    SK  0                          8171   6785                244      U3.200            CN  76
26640        5650 SK  DAE DONG SB.    SK  0                          8171   6785                244      U3.200            CN  76
27372        5650 SK  DAE DONG SB.    SK  0                          8171   6785                244      U3.200            CN  76
28751        2900 D   RICKMERS WERFT  I                                    11000           71  214      M23.000           CV  77
27581        7519 D   LINDENAU,PAUL   S                             16700                 109  464   12 K70.000           CV  77
26005       13880 D   HOWAL DT.-D.WFT. D  J-1-40                                                 550      M46.500           CN  77
26006       13880 D   HOWAL DT.-D.WFT. D  J-1-40                                                 550      M46.500           CN  77
26007       13880 D   HOWAL DT.-D.WFT. D  J-1-40                                                 550      M46.500           CL  77
27424       14300 D   HOWAL DT.-D.WFT. D                            40000                        316      M50.000           CV  77
27425       15075 D   HOWAL DT.-D.WFT. D                                   42276                 750      M50.000           CV  77
26001       32470 D   FLENDER WERFT   D   0                                                     1758      M90.000           CL  77
26002       32477 D   FLENDER WERFT   D   0                                                     1758      M90.000           CL  77
29176       47197 D   WESER,A.C.      CB  0                                                     2436      L20.000           CR  77
28221        1900 DK  DANNEBROG VFT.  N                                                          180      D30.000           CV  77
29592       19378 F   CH.ATLANTIQUE   F                                    28500                 637      F150.000          CV  77
29590       19669 F   CH.ATLANTIQUE   F   D-2-40,D-2-25                    28500                 637      F150.000          CV  77
29591       19669 F   LA CIOTAT       F   C-2-25,C-2-40,D-1-5              28510                 637      F150.000          CV  77
27033        2686 HK  CHUNG WAH SB.   CB  0-1-30                                                 190      L2.250            CN  77
29770        1536 JAP KAGOSHIMA DKYD. IRL                                                        122      Y0.700            CN  77
29771        1536 JAP KAGOSHIMA DKYD. GB                                                         122      Y0.700            CN  77
28027        1555 JAP KAGOSHIMA DKYD. IRL                                                        122      Y0.600            CN  77
28028        1555 JAP KAGOSHIMA DKYD. D                                                          122      Y0.600            CN  77
28029        1555 JAP KAGOSHIMA DKYD. E                                                          122      Y0.600            CN  77
28017        2213 JAP KAGOSHIMA DKYD. IRL 0                          3528   3123                122      Y0.600            CN  77
27165        2900 JAP NIIGATA ENG.    F                                                     1    145      Y5.700 70/07      CV  77
27162        2900 JAP NIIGATA ENG     F                                                     1    145      Y5.700 70/07      CV  77
27105        3000 JAP NIIGATA ENG.    AO                                                                  Y3.000 70/07      CV  77
27106        3000 JAP NIIGATA ENG     AC                                                                  Y3.000 70/07      CV  77
27117        3000 JAP TOWA ZOSEN      AO                                                                  Y3.000 70/07      CV  77
27118        3000 JAP TOWA ZOSEN      AO                                                                  Y3.000 70/07      CV  77
28737        5758 JAP HASHIHAMA SB.   SNG                                                        310      Y2.000            CF  77
30153        5944 JAP TSUNEISHI ZOSEN HK  0                                                      186      Y1.450            CN  77
26145        6340 JAP YAMANISHI ZOSEN D   0-1-30                     9780   9191                358      Y1.700 99/99      CN  77
26609        6121 JAP SHINHAMA DKYD.  CB  0-1-30                                                 318      Y1.950 99/99      CN  77
28610        6583 JAP SETOUCHI ZOSEN  CB  0-1-30                                                 352      Y3.000 CASH       CV  77
28611        6596 JAP SETOUCHI ZOSEN  CB  0-1-30                     9962   9748                352      Y3.000 99/99      CV  77
26461        6800 JAP SHINHAMA DKYD.  CB  0-1-38                                                 318      Y1.400            CV  77
28745        7053 JAP MIHO SHIPYARD   GB  0-1-22                                                 320      Y1.500            CF  77
29237        7053 JAP MIHO SHIPYARD   CB  0-1-22                                                 320      Y1.500            CF  77
27633        7218 JAP KURUSHIMA DKYD. FUN                                                        326      Y1.600 70/07      CV  77
29967        7727 JAP MIHO SHIPYARD   HK  0-1-24                                                 372      Y1.700            CF  77
27459       15175 JAP SASEBO HVY.IND. D                                    42276                 750      Y6.000 70/07      CV  77
27458       15200 JAP SASEBO HVY.IND. D                                    40000                 522      Y6.000 70/07      CV  77
29177       15567 JAP NAMURA ZOSEN    JAP C-2-26,C-2-21,C-1-15      22202  21472          490  432      Y2.500            CV  77
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TYPE2 ....  DWT... COY SHIPYARD....... CDO CARGO HANDLING GEAR.......... GRAIN  BALE.. REEFER VEHS CONTS PSGO N/B PRICE....... VTP 99

28534       22497 JAP KAWASAKI H. I.   CR  C-1-85,C-3-50                                    1315      Y9.400 70/07      CV  77
27056       22735 JAP KAWASAKI H I.    KWI C-1-85,C-3-50                     80000           1315      L12.000           CV  77
27055       22853 JAP KAWASAKI H. I.   KWI C-1-85,C-3-50                                    1315      L12.000           CV  77
26153       30934 JAP I.H.I.           SNG 0                                                1569      Y9.500 60/06      CL  77
26592        1200 N   FOSEN M>K.V.     N   C-1-8                      4245    4174    566            21      N23.000           CP  77
26593        1200 N   FOSEN M>K.V.     N   C-1-8                      4245    4174    566            40      N23.000           CP  77
27581        8946 S   LODOSE VARF      S                                                  550   338      K70.000           CV  77
27370        2957 SK  DAE DONG SB.     SK  0                                                 120      U3.400            CN  77
27371        2957 SK  DAE DONG SB.     SK  0                                                 120      U3.400            CN  77
27253        5650 SK  DAE DONG SB.     SK  0                          8171    6785                   244      U3.200            CN  77
26032        8113 SK  HYUNDAI H. I.    S                                                     562      U11.000 70/07     CV  77
26034        8652 SK  HYUNDAI H. I.    CB  0                                                 562      U11.000 70/07     CV  77
26030        8672 SK  HYUNDAI H. I.    S   0                                                 562      U11.000 70/07     CV  77
26031        8672 SK  HYUNDAI H I.     S   0                                                 562      U11.000 70/07     CV  77
28543        2600 SNG SINGAPORE SLIP.  CB  0-1-30                                            190      U4.600            CN  77
29010        8943 ZA  DORMAN LONG      ZA  0-1-35                                            408      L5.000            CN  77
29562       10651 D   LINDENAU,PAUL    I                             16700                  109   721   12 K70.000           CV  78
26003       32484 D   FLENDER WERFT    D   0                                                1758      M90.000           CL  78
26001       32484 D   FLENDER WERFT    D   0                                                1758      M90.000           CL  78
29177       47209 D   WESER,A.G.       CB  0                                                2436      L20.000           CR  78
26079       49730 D   HOWALDT.-D.WT.   D   0                                                2434      M200.000          CR  78
28756        3297 DK  FREDERIKSHAVN    DK  0                         11320   10188           411   200      D50.000           CV  78
28775        3100 DK  FREDERIKSHAVN    HK  0                         11320   10188           411   200      D50.000           CV  78
29592       19669 F   LA CIOTAT        F   D-2-40,D-2-25                     28510                  637      F150.000          CV  78
29593       19669 F   LA CIOTAT        F   C-2-25,C-2-40,D-1-5               28000                  637      F150.000          CV  78
29597       19669 F   CH.ATLANTIQUE    F   C-2-40,C-2-25                     28510                  637      F150.000          CV  78
29764        4352 CB  APPLEDORE SB.    CB  0                          6900    6720                   300      L4.000            CN  78
29144        7500 CB  SMITHS DOCK CO.  CB                                                    440      L8.200            CV  78
29145       16114 CB  SMITHS DOCK CO.  CB  C-3-26,C-1-35                                     721      L10.000           CR  78
29147       16114 CB  SMITHS DOCK CO   CB  C-3-26,C-1-35                                     721      L10.000           CR  78
26103        8716 IL  ISRAEL SHPYDS.   IL  0                                                 420      U15.000           CL  78
26102        9000 IL  ISRAEL SHPYDS.   IL  0                                                 420      U15.000           CL  78
29773        1536 JAP KAGOSHIMA DKYD.  CB                                                    122      Y0.700            CN  78
30042        1816 JAP TERAOKA ZOSEN    A                                                     104      Y1.800            CV  78
30041        1835 JAP TERAOKA ZOSEN    A                                                     104      Y1.800            CV  78
27772        2213 JAP KAGOSHIMA DKYD.  IRL 0                          3532    3127                   122      Y0.700            CN  78
30074        2600 JAP MIHO SHIPYARD    NL                                                    150      Y1.250 99/99      CF  78
29054        2650 JAP UBE DKYD.        AUS                                                   145      Y1.800            CV  78
27119        3000 JAP TOHA ZOSEN       AO                                                             Y3.000 70/07      CV  78
27641        3000 JAP TOHA ZOSEN       AO                                                             Y3.000 99/99      CV  78
27643        3516 JAP TOHA ZOSEN       AO                                                             Y3.000 99/99      CV  78
30341        4617 JAP KASADO DKYD.     CB  0-1-30                    10500   10000                   378      U5.500            CV  78
27403        5692 JAP KAWASAKI H I.    CB                                                    404      Y3.000            CV  78
29676        6552 JAP HITACHI ZOSEN    DK  R-1-70,0-1-10                                     390      D90.000 70/07     CV  78
27061        6580 JAP SETOUCHI ZOSEN   CB  0-1-38                                            352      Y3.000 99/99      CV  78
29060        6596 JAP SETOUCHI ZOSEN   CB  0-1-38                                            352      Y3.000 99/99      CV  78
30183        6945 JAP KAGOSHIMA DKYD.  CB                                                    352      Y2.000            CV  78
31379        7093 JAP NIPPON KOKAN     JAP D-1-25                             2321                   135      Y1.800            CV  78
31077        7150 JAP TSUNEISHI ZOSEN  JAP 0                                                 445      Y1.300            CN  78
30774        7/27 JAP MIHO SHIPYARD    HK  0-1-22                                            372      Y1.700            CF  78
30240        8502 JAP TSUNEISHI ZOSEN  HK                                                    430      Y1.570 99/99      CR  78
30249        8502 JAP TSUNEISHI ZOSEN  HK                                                    430      Y1.570 99/99      CR  78
31084        8979 JAP KANDA ZOSEN      CB  0-2-35                                            576      U8.368            CV  78
30296        9332 JAP MINAMI NIPPON    CR                                                 110   510      Y2.700 99/99      CV  78
30097        9332 JAP MINAMI NIPPON    CR                                                 110   506      Y2.700 99/99      CV  78
29781        9810 JAP KAWASAKI H I.    D                                                  125   556      Y4.600            CV  78
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TYPE2 .... DWT... COY SHIPYARD......   CDO CARGO HANDLING GEAR.......... GRAIN. BALE . REEFER VEHS CONTS PSSG N/B PRICE....... VTP 99

30060          11020 JAP KAWASAKI H.I.     I                                                        380      Y4.700         CV  78
30002          12007 JAP MITSUI ZOSEN      S   C-1-25                     19255                     800      Y4.300         CV  78
30001          12200 JAP MITSUI ZOSEN      S   C-1-25                     19255                     800      Y4.300         CV  78
30003          12200 JAP MITSUI ZOSEN      S   C-1-25,R-1-150             22322                     800      Y4.300         CV  78
28160          12800 JAP MIE ZOSEN         USA 0                                                    655      U10.000        CF  78
28161          12800 JAP MIE ZOSEN         USA 0                                                    655      U10.000        CF  78
28162          13000 JAP MIE ZOSEN         SK  0                                                    7/0      Y3.300         CF  78
29591          15151 JAP HITACHI ZOSEN     SNG 0                                                    856      A12.500        CL  78
29592          15151 JAP HITACHI ZOSEN     SNC 0                                                    856      A12.500        CL  78
29593          15151 JAP HITACHI ZOSEN     SNC 0                                                    856      A12.500        CL  78
29594          15151 JAP HITACHI ZOSEN     SNC 0                                                    856      A12.500        CL  78
30746          15151 JAP HITACHI ZOSEN     SNC 0                                                    856      Y3.500         CN  78
29525          17012 JAP NARAZAKI ZOSEN    TAI C-2-30                     22407                     486      Y2.000 99/99   CN  78
30242          18674 JAP NAMURA ZOSEN      USA 0                                                    909      Y3.500 99/99   CN  78
31192          19455 JAP I.H.I.            S                                                        353      Y3.500         CN  78
30744          20000 JAP ONOMICHI ZOSEN    TAI                                                     1430      Y3.500 99/99   CL  78
30745          20000 JAP ONOMICHI ZOSEN    TAI                                                     1430      Y3.500 99/99   CL  78
29679          20195 JAP HAYASHIKANE SB.   TAI 0                                                   1408      Y3.300 70/07   CL  78
29680          20239 JAP HAYASHIKANE SB.   HK  0                                                   1408      Y3.300 70/07   CL  78
30325          21178 JAP I.H.I.            S   0                                                   1266      Y3.500         CL  78
30326          21207 JAP I.H.I.            S   0                                                   1266      Y3.500         CL  78
30561          22400 JAP NAMURA ZOSEN      SK                                                      1036      Y4.000         CL  78
30419          23991 JAP TSUNEISHI ZOSEN   HK  0                                                   1934      Y3.500 99/99   CL  78
30448          24035 JAP TSUNEISHI ZOSEN   HK                                                      1288      Y3.500 99/99   CL  76
31126          24344 JAP MITSUBISHI        JAP 0                                                   1072      Y4.960         CL  78
30240          24355 JAP I.H.I.            CB  0                                                   1176      Y3.800         CL  78
30324          24355 JAP I.H.I.            CB  0                                                   1176      Y3.800         CL  78
29741          25000 JAP NIPPON KOKAN      IL                                                      1550      Y7.000 99/99   CV  78
29603          28092 JAP MITSUBISHI        S                              56217   4500             1500      Y7.000         CV  78
29926          31262 JAP SASEBO HVY. IND.  CR                                                      1175      Y5.000         CV  78
29927          31262 JAP SASEBO HVY. IND.  CR                                                      1175      Y5.000         CV  78
30068          31262 JAP SASEBO HVY. IND.  CR                                                      1175      Y5.000         CV  78
29406          31460 JAP MITSUBISHI        S                                      8600  620        1707      Y7.500 99/99   CV  78
29407          31460 JAP MITSUBISHI        N                                      8600  620        1707      Y7.500 99/99   CV  78
26594           1200 N   FOSEN M.K.V.      N                       4245    4174    566               33      N23.000        CP  78
29193           1200 N   TROSVIK VERKS     N                                             250        104      N32.500        CV  78
29477           1200 N   TROSVIK VERKS     N                                             250        104      N35.600        CV  78
29472           1450 N   FOSEN M.K.V.      FA                             4870                       24      N45.000        CP  78
30479           3019 N   AKER GROUP        N                                             250        448      N58.000        CV  78
29004           5182 N   A.VUIJK & ZONEN   CH                                                       356      G35.000        CV  78
27583           8946 S   LODOSE VARF       S                                             230        308      K70.000        CV  78
26038           8113 SK  HYUNDAI H.I.      S   0                                                    562      U11.000 70/07  CV  78
26034           8672 SK  HYUNDAI H.I.      S   0                                                    562      U11.000 70/07  CV  78
26035           8672 SK  HYUNDAI H.I.      S   0                                                    562      U11.000 70/07  CV  78
26036           8672 SK  HYUNDAI H.I.      S   0                                                    562      U11.000 70/07  CV  78
26039           8704 SK  HYUNDAI H.I.      S   0                                                    562      U11.000 70/07  CV  78
26040           8704 SK  HYUNDAI H.I.      S   0                                                    562      U11.000 70/07  CV  78
26037           9500 SK  HYUNDAI H.I.      S   0                                                    562  144 U11.000 70/07  CV  78
20549           2600 SNG SINGAPORE SLIP.   HK  0-1-30                                               190      U4.600         CN  78
29247          26624 USA BATH IRON WORKS   USA 0                                                   1658      U50.720        CR  78
29011           8943 ZA  DORMAN LONG       ZA  0-1-35                                               408      L5.000         CN  78
31484           2560 D   HOWALDT.-D.W-I    D   C-2-25              6182    5910                     319      M12.400        CV  79
31480           2680 D   HOWALDT.-D.W-I    D   C-2-25                      6182                     319      M12.400        CV  79
31481           2680 D   HOWALDT.-D.W-I    D   C-2-25              6182                             319      M12.400        CV  79
31482           2680 D   HOWALDT.-D.W-T    D   C-2-25                                               319      M12.400        CV  79
31483           2680 D   HOWALDT.-D.W-T    D   C-2-25              5600                             319      M12.400        CV  79
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NVE2....  DWT...  COY SHIPYARD......  CDO CARGO HANDLING GEAR..........  GRAIN.  BALE..  REEFER VEHS CONTS PSSO N/B PRICE.......  VTP 99

37527      3400  D    NOBISKRUG         D   0                               7136    7137                  383      D15.000          CD  79
31060      5536  D    SIETAS, J. J.     FUN                                 7363    6995                  313      M13.500          CV  79
31061      5600  D    SIETAS, J. J.     TO                                  7368    6995                  313      M13.500          CV  79
31072     12800  D    SCHURENSTEDT      D   0                              16316   15255                  602      M29.000          CN  79
30043     20100  D    WESER SEEBECK     D   0-1-20                                                       1211      M53.333          CR  79
30044     20100  D    WESER SEEBECK     D   0-1-20                                                       1211      M53.333          CR  79
31048      3390  DK   ELSINORE SB.      DK  7-1-55, 7-1-3                           9770            441   274      D50.000          CV  79
30444      3540  DK   FREDERIKSHAVN     DK  0                              10320   10188            441   200      D53.333          CV  79
30443      3620  DK   FREDERIKSHAVN     HK  0                              10320   10188            441   200      D53.333          CV  79
30098      4120  GB   SWAN HUNTER       CB  0                               6400                          288      L4.000           CN  79
29365      4352  CB   APPLEDORE SB.     CB  0                               6900    6720                  300      L4.000           CN  79
30202      4352  CB   SWAN HUNTER       CB  0                               6400                          288      L4.000           CN  79
30207      4352  CB   APPLEDORE SB.     CB  0                                                             300      L4.000           CN  79
30209      4352  CB   APPLEDORE SB.     CB  0                                                             300      L4.000           CN  77
29145      7500  CB   SMITHS DOCK CO    CB                                                                440      L8.200           CV  79
30118      3380  JAP  MITSUI ZOSEN      CB                                                                240      Y3.866           CV  79
31010      3800  JAP  USUKI TEKKOSHO    HK  0                                                             210      Y1.000           CN  79
30042      4631  JAP  KASADO DKYD.      REX 0-1-30                         10500   10000                  378      U5.500           CV  79
31785      4634  JAP  KASADO DKYD.      CB  0-1-30                         10500   10000                  378      U7.000 99/99     CV  79
32780      4652  JAP  FUKUOKA ZOSEN     JAP C-1-20                          8247    7829                  250      Y1.140 99/99     CN  79
30117      5024  JAP  MITSUI ZOSEN      CB                                                                240      Y3.866           CV  79
32119      6300  JAP  NARAZAKI ZOSEN    HK  0-1-30                                                        349      U5.000           CF  79
30484      6943  JAP  KAGOSHIMA DKYD.   CB                                                                352      Y2.000           CV  79
30562      8002  JAP  NIPPON KOKAN      JAP C-1-36, D-1-120                        18570                  476      Y4.500 99/99     CV  79
30563      8002  JAP  NIPPON KOKAN      JAP D-1-120, C-1-36                        18570                  476      Y4.500 99/99     CV  79
30561      8002  JAP  NIPPON KOKAN      JAP D-1-120, C-1-36                        18570                  476      Y4.500 99/99     CV  79
30565      8002  JAP  NIPPON KOKAN      JAP D-1-120, C-1-36                        18570                  476      Y4.500 99/99     CV  79
31412      8319  JAP  MITSUBISHI        CB                                                                426      Y1.800           CN  79
31107      8945  JAP  KANDA ZOSEN       CB  0-2-35                                                        576      U8.368           CV  79
31069      9002  JAP  KANDA ZOSEN       CB  0-2-35                                                        576      U8.368           CV  79
31507      9100  JAP  TSUNEISHI ZOSEN   JAP 0                                                             500      Y1.270 99/99     CN  79
31564      9100  JAP  TOHOKU ZOSEN      TAI 0                                                             400      Y1.200           CN  79
29487      9810  JAP  KAWASAKI H. I.    JAP                                                         125   556      Y4.600           CV  79
30004     12007  JAP  MITSUI ZOSEN      S   C-1-25, R-1-150                        22322                  800      Y4.300           CV  79
31443     12161  JAP  TSUNEISHI ZOSEN   JAP C-2-25, C-1-30                         27946                  645      Y2.400 99/99     CV  79
31449     12169  JAP  TSUNEISHI ZOSEN   JAP C-2-25, C-1-30                         27946                  645      Y2.400 99/99     CV  79
30005     12200  JAP  MITSUI ZOSEN      S   C-1-25                                 19255                  800      Y4.300           CV  79
30006     12200  JAP  MITSUI ZOSEN      S   C-1-25                                 19255                  800      Y4.300           CV  79
30755     12276  JAP  I. H. I.          CB                                                                548      Y3.000           CF  79
30747     15151  JAP  HITACHI ZOSEN     SNG 0                                                             856      Y3.500           CN  79
30215     17100  JAP  NAMURA ZOSEN      USA 0                                                             909      Y3.500 99/99     CN  79
30243     18674  JAP  NAMURA ZOSEN      USA 0                                                             909      Y3.500 99/99     CN  79
30244     18674  JAP  NAMURA ZOSEN      USA 0                                                             909      Y3.500 99/99     CN  79
31191     18946  JAP  NAMURA ZOSEN      HK  0                                                             926      Y3.725           CL  79
31190     18964  JAP  NAMURA ZOSEN      HK  0                                                             909      Y3.725           CL  79
29742     25000  JAP  NIPPON KOKAN      IL                                                               1733      Y7.000 99/99     CV  79
29601     28170  JAP  MITSUBISHI        S                                                 4500           1546      Y7.000           CV  79
32194     28900  JAP  ONOMICHI ZUSEN    TAI 0                                                            1790      Y3.500           CL  79
32026     29701  JAP  MITSUBISHI        JAP                                                              1584      Y5.100 99/99     CL  79
31429     29868  JAP  MITSUI ZOSEN      JAP 0                                                            1570      Y5.060           CL  79
29602     32015  JAP  MITSUBISHI        N   C-1-40                                 61521  0400    620    1772      Y7.500 99/99     CV  79
30492     32037  JAP  MITSUBISHI        CB  C-1-40                                                       1778      Y6.500           CV  79
30493     32037  JAP  MITSUBISHI        CB  C-1-40                                                       1778      Y6.500           CV  77
30000     33000  JAP  MITSUI ZOSEN      S   C-1-40                                                       1848      Y8.000           CV  79
30424     49149  JAP  SUMITOMO H. I.    PTM 0                                                            2770      Y9.250           CL  79
[illegible]       JAP  SUMITOMO H. I.    PTM 0                                                            2770      Y9.250           CL  79
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TYPE2.....  DWT... CDY SHIPYARD ....     CDO CARGO HANDLING GEAR.......... GRAIN. BALE.. REEFER VEHS CONTS PSSO N/B PRICE....... VTP 99

31701          1200 N   FOSEN M-K.V.      N   D-1-40,C-1-12                3705          538              22      N27.000         CP  79
29473          1450 N   FOSEN M-K.V.      FA                                     4870                     26      N45.000         CP  79
30090          2060 N   SANDNESSJOEN      DOM                                                            148      N12.600         CV  79
30091          2060 N   SANDNESSJOEN      DOM                                                            148      N12.600         CV  79
30093          2090 N   NOROFF A/S        DOM                                                            148      N12.600         CV  79
30047          3041 N   FOSEN M-K.V.      N   C-1-28,R-1-48               10126  9963                     75      N40.000         CP  79
30714          3314 N   ANKERLOKKEN       TR                                                             318      N56.000         CV  79
30713          3500 N   ANKERLOKKEN       TR                                                             318      N56.000         CV  79
29724          5290 N   VAAGEN VERFT      N                                                     108      448      N55.000         CV  79
30049          9458 N   ANKERLOKKEN       N                                                              553      N58.500 80/12   CV  79
29783         43103 N   FREDRIKSSTAD      N   0                                  64900         3600      858      N146.000        CV  79
29789         43343 N   FREDRIKSSTAD      N   0                                  64900         3500      858      N146.000        CV  79
30765          6950 S   GOTAVERKEN CRP.   S                                                              480      K70.000         CV  79
30767          6950 S   GOTAVERKEN CRP.   S                                                              480      K70.000         CV  79
30763          6950 S   GOTAVERKEN CRP.   S                                                              480      K70.000         CV  79
31203          7450 SF  RAUMA-REPOLA      GB                                     27470                   354   12 L8.500          CV  79
30791         24272 SK  HYUNDAI H.I.      KWI 0                                                         1612      U15.000         CL  79
30794         24272 SK  HYUNDAI H.I.      KWI 0                                                         1612      U15.000         CL  79
30793         24302 SK  HYUNDAI H.I.      KWI 0                                                         1612      U15.000         CL  79
30792         24349 SK  HYUNDAI H.I.      KWI 0                                                         1612      U15.000         CL  79
29010         16401 USA BATH IRON WORKS USA                                                             1070      U43.080         CN  79
29011         26670 USA BATH IRON WORKS USA                                                             1070      U43.080         CN  79
28037         28150 USA BETH STEEL SB.    USA D-1-70,D-1-30                                             1708   12 U78.300         CR  79
32523          4320 D   NOBISKRUG         D                                       8530                   383      D15.000         CD  80
33069         10500 D   MEYER,JOS.L.      USA                                                   172      508      U19.500         CV  80
32024         18250 D   BREMER VULKAN     NZ  G-4-36                                                     825      E25.000         CN  80
32487         21617 D   THYSSEN NSWKF.    D   0                           35131                         1253      D50.000         CN  80
30045         24320 D   WESER SEEBECK     D   0                                                         1211      M53.333         CR  80
30545          3297 DK  FREDERIKSHAVN     DK  0                           10320 10188           411      230      D53.333         CV  80
32170         31600 DK  LINDOVAERFT       DK  0                                                         2052      D0.000 80/14    CL  80
32171         31600 DK  LINDOVAERFT       DK  0                                                         2052      D0.000 80/14    CN  80
32023         16378 GB  SWAN HUNTER       GB  C-4-35                                                     768      L18.000         CR  80
32022         16511 GB  SMITHS DOCK CO.   GB  C-4-36                                                     768      L18.000         CR  80
33451          6994 JAP USUKI TEKKOSHO    T   C-2-40                                                     396      Y1.500          CF  80
32433         13810 JAP HAYASHIKANE SB.   CHI                             27350 25600                             Y2.300          CV  80
31707         23250 JAP MITSUI ZOSEN      USA                                                           1678      U30.000         CL  80
31708         23250 JAP MITSUI ZOSEN      USA                                                           1678      U30.000         CL  80
31709         23250 JAP MITSUI ZOSEN      USA                                                           1678      U30.000         CL  80
31700         23302 JAP MITSUBISHI        USA 0                                                         1678      U30.000         CL  80
31701         23302 JAP MITSUBISHI        USA 0                                                         1678      U30.000         CL  80
31702         23302 JAP MITSUBISHI        USA 0                                                         1678      U30.000         CL  80
31703         23302 JAP MITSUBISHI        USA 0                                                         1678      U30.000         CL  80
31704         23302 JAP MITSUBISHI        USA 0                                                         1678      U30.000         CL  80
31705         23302 JAP MITSUBISHI        USA                                                           1678      U30.000         CL  80
31706         23302 JAP MITSUBISHI        USA                                                           1678      U30.000         CL  80
33218         26900 JAP KAWASAKI H.I.     SK                                                            1781      Y6.000          CL  80
33124         27500 JAP I.H.I.            JAP 0                                                         1197      Y4.400 99/99    CL  80
32195         28900 JAP ONOMICHI ZOSEN    TAI 0                                                         1790      Y3.500          CL  80
32196         28900 JAP ONOMICHI ZOSEN    TAI 0                                                         1790      Y3.500          CL  80
32197         28900 JAP ONOMICHI ZOSEN    TAI 0                                                         1790      Y3.500          CL  80
32555         31301 JAP KAWASAKI H.I.     JAP                                                           1718      Y4.930 99/99    CL  80
32783         37400 JAP HITACHI ZOSEN     JAP 0                                                         1598      Y4.930 99/99    CL  80
30778          5000 N   VAAGEN VERFT      N                                                     108      435      N61.000         CV  80
31760          4465 S   KARLSKRONA VARV   S                                                              320      K43.500         CV  80
31779          4938 S   KARLSKRONA VARV   S                                                              185      K43.500         CV  80
32053         18451 S   OSKARSHAMN        S   C-1-33,C-1-25                                             1132      U40.000         CV  80
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TYPE2.....  DWT... COY SHIPYARD........ CDO CARGO HANDLING GEAR........ GRAIN. BALE.. REEFER VEHS CONTS PSSG N/B PRICE....... VTP 99

32092       18541  S   OSKARSHAMN       S   C-1-33,C-1-25                                          1132      U40.000          CV  80
31237        7200  SF  RAUMA-REPOLA     PL                                   27470                354   12 U12.000          CV  80
32526        7984  SF  RAUMA-REPOLA     SF                                   23772                454      U13.500          CV  80
32527        7984  SF  RAUMA-REPOLA     SF                                   23772                505      U13.500          CV  80
31603        8514  TAI CHINA SB. CORP.  D   0                           11160  10700                443      U5.200           CN  80
31468       31208  TAI CHINA SB. CORP.  TAI 0                                                      1608      U19.000          CL  80
31469       31218  TAI CHINA SB. CORP.  TAI 0                                                      1608      U19.000          CL  80
31464       31246  TAI CHINA SB. CORP.  TAI 0                                                      1608      U19.000          CL  80
31465       31251  TAI CHINA SB. CORP.  TAI 0                                                      1608      U19.000          CL  80
31466       31264  TAI CHINA SB. CORP.  TAI 0                                                      1608      U19.000          CL  80
31467       31264  TAI CHINA SB. CORP.  TAI 0                                                      1608      U19.000          CL  80
31463       31265  TAI CHINA SB. CORP.  TAI 0                                                      1608      U19.000          CN  80
30797       26000  USA SUN SB. & DD.    USA                                                        1212      U75.500          CL  80
28040       30686  USA BETHLEHEM SB.    USA D-1-70,D-1-30                                          1708      U78.300          CR  80
30038       38500  USA AVONDALE SB.     USA                                                         665      U70.000          CJ  80
32683       25070  B   N.V. BOELWERF    B   0                                                      1278      U34.000 80/15    CL  81
32041       24723  BR  ISHIBRAS         HK  0                                                      1948      U30.000          CL  81
32042       30220  BR  ISHIBRAS         HK  0                                                      1750      U30.000          CL  81
35007        4150  D   NOBISKRUG        D   0                            7278   7080                287      M20.000          CN  81
33292       20758  D   FLENSBURGER      RI                                                         1152      D54.000          CN  81
32488       21569  D   THYSSEN NSWKF.   D   0                           35131                      1253      D50.000          CN  81
32722       51540  D   HOWALDT.-D.WFT.  D   0                                                      3045      M110.000         CL  81
32172       31600  DK  LINDOVAERFT      DK  0                             840                      2052      D0.000 80/14     CN  81
32173       31600  DK  LINDOVAERFT      DK  0                             840                      2052      D0.000 80/14     CN  81
32270       22603  F   LA CIOTAT        PL                                                         1417      F300.000         CV  81
32273       22619  F   CH. ATLANTIQUE   PL  7-1-50                      18000                      1417      F300.000         CV  81
32272       22620  F   CH. ATLANTIQUE   PL                                   40713               1417      F300.000         CV  81
32271       22977  F   LA CIOTAT        PL  7-1-50                      26400                      1417      F300.000         CV  81
30209        4352  GB  APPLEDORE SB.    GB  0                                                       300      L4.000           CN  81
32083        3950  I   I.N.M.A.         I                                                           215      U9.500           CN  81
32501        6235  I   APUANIA, C.N.    GR                                                          320      U15.000          CV  81
32502        6235  I   APUANIA, C.N.    GR                                                          352   80 U15.000          CV  81
31058       17993  I   BREDA, C.N.      GB  0-2-38                                                 1130      U18.500          CV  81
31059       18500  I   BREDA, C.N.      GB  0-2-38                                                 1130      U18.500          CV  81
33655        6100  JAP USUKI TEKKOSHO   HK                                                          396      Y1.500           CF  81
34796       28615  JAP HITACHI ZOSEN    JAP                                                        1450      Y7.000           CL  81
34246       33185  JAP MITSUBISHI       JAP 0                                                      1770      Y6.600 99/99     CL  81
34230        2070  N   AMELS,C.         IL                                                                36 L4.800           CV  81
32700       29082  N   VAN DER GIESSEN  IL  0                                                      1738      G75.000          CL  81
32701       29547  N   VAN DER GIESSEN  IL                                                         1738      G75.000          CL  81
33012       22447  SF  VALMET,HELSINKI  GU  0                                  55418          275  1499   12 S200.000         CV  81
33013       22447  SF  VALMET,HELSINKI  GU  0                                  55418          275  1499   12 S200.000         CV  81
34250        7826  SNG SINGAPORE SB.    GR  C-1-25,C-1-40                                           432      U11.000 85/10    CL  81
31065        8507  TAI CHINA SB. CORP.  D   0                           11160  10700                443      U5.200           CN  81
31605        8514  TAI CHINA SB. CORP.  D   0                           11160  10700                443      U5.200           CN  81
31064        8514  TAI CHINA SB. CORP.  D   0                           11160  10700                443      U5.200           CN  81
30037       41165  USA AVONDALE SB.     USA                                                         665      U70.000          CJ  81
36551        2575  D   NOBISKRUG        D   C-2-25                              6190                319      M17.625          CV  82
35044        4240  D   CASSENS, C.      D   C-2-25                       8376                       409      M21.850          CV  82
37407       10148  D   SCHICHAU         D   C-2-36                      12460  11837                617      M35.000          CN  82
36069       11745  D   SIETAS, J.J.     D   C-2-35                      15623  14911                605      M30.000          CN  82
35532       14921  D   UNTERWESER       IL  0                                                       706      M27.500          CL  82
35167       20758  D   FLENSBURGER      RI  C-2-35                                                 1152      U30.000          CN  82
33273       20815  D   FLENSBURGER      RI  C-2-35                                                 1152      D54.000          CN  82
36207       25150  D   THYSSEN NSWKF.   D   C-3-35,C-1-25               33918                      1282      M71.850          CN  82
36115       28148  D   WESER, A.G.      D   C-3-40,C-1-20               36911                      1346      M70.960          CL  82
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TYPE?..... DWT... COY SHIPYARD....... CDO CARGO HANDLING GEAR.......... GRAIN  BALE.. REEFER VEHS CONTS PSSG N/B PRICE....... VTP 99

35141       31589 D   THYSSEN NSWKF   CB  O                                     60743                  1944       U40.000          CL  82
35235        7225 DK  FREDERIKSHAVN   DK  R-2-35                                14610          512    414       D90.000          CV  82
35236        7230 DK  FREDERIKSHAVN   DK  R-2-35                                13790          572    414       D90.000          CV  82
35920        1267 JAP UBE DKYD.       AUS                                2311    2039                    32       Y1.100           CV  82
34051        5822 JAP HAYASHIKANE SB. PTM C-3-22                                                        292       Y1.000           CN  82
36053        5827 JAP HAYASHIKANE SB. PTM C-3-22                                                        292       Y1.000           CN  82
36080        7200 JAP YAMANISHI SB.   JAP                                                               440       Y1.500           CF  82
35466       31855 JAP MITSUI ZOSEN    JAP O                                                            1676       Y7.500           CL  82
34658       33559 JAP I.H.I.          ZA                                                               1704       Y8.000           CL  82
23736       17173 PL  STOCZ.GDANSKA   SU                                        32846                   634       0100.000         CV  82
33735       18000 PL  STOCZ.GDANSKA   SU                                                                          0100.000         CV  82
36690       40150 S   KOCKUMS M-K.V.  IBN O                                     71500          530  2025       K325.000         CV  82
36230       35500 SK  HYUNDAI H.I.    KWI O                                                            1846       U36.000          CL  82
34752        7800 SNG SINGAPORE SB.   CR  C-1-40,C-1-25                                                 431       U11.000 85/10    CL  82
34751        7826 SNG SINGAPORE SB.   CR  C-1-40,C-1-25                                                 431       U11.000 85/10    CL  82
37446        4600 SU  ZHDANOV SHPYD.  YU                                                       500    243       U11.000          CV  82
31726       30825 USA AVONDALE SB.    USA                                               400        2500       U90.000          CL  82
37537        3150 BR  EST.MAUA        BR  C-2-25                                                    260       U9.250           CV  83
36091        3250 D   CASSENS,C.      D   C-2-25                                 8376                   409       M20.000          CV  83
37032        3580 D   NOBISKRUG       D   C-2-25                                 5850                   278       M19.000          CV  83
37474        3580 D   NOBISKRUG       D   C-2-35                                 6174                   278       M20.000          CV  83
37475        3580 D   NOBISKRUG       D   C-2-35                                 6174                   278       M21.500          CV  83
39620        3600 D   SIETAS,J.J.     D   O                                                             356       M20.000          CN  83
38074        6800 D   BREMER VULKAN   D   C-2-40                         9555    9379                   468       M28.850          CN  83
39605        9300 D   LINDENAU,PAU    D   C-4-18                        12165   12130                   560       M33.400          CN  83
37408       10124 D   SCHICHTING      D   C-2-36                        12475   11852                   617       M35.000          CN  83
37193       13850 D   NOBISKRUG       D   O                                     17000                   932       M50.000          CL  83
36704       14030 D   ORENSTEIN KOPP. D   O                                                             933       M50.000          CN  83
37194       14436 D   NOBISKRUG       D   O                                                             932       M50.000          CL  83
37707       24950 D   THYSSEN NSWKF   D   C-2-40,C-1-25                                                1282       M70.000          CN  83
36017       20122 D   WESER,A.G.      D   C-3-40,C-1-20                                                1346       M70.960          CL  83
37067       28422 D   WESER,A.G.      D   C-3-40,C-1-20                 36911                          1346       M70.960          CL  83
35142       31589 D   THYSSEN NSWKF   CB  O                                                            1944       U40.000          CL  83
37456        7225 DK  FREDERIKSHAVN   DK                                13790                  512    414       D125.000         CV  83
36493       32410 F   CH.ATLANTIQUE   F   C-4-40,C-2-1-0                                               1600       L19.500          CN  83
37433        1100 GB  RICHARDS(SB)LTD IS  C-1-35                                 3815                    61    4 L3.330           CP  83
37258        2530 JAP MIHO SHIPYARD   USA                                                               176       Y1.400 CASH      CN  83
37259        2530 JAP MIHO SHIPYARD   USA                                                               176       Y1.400 CASH      CN  83
38100        9649 JAP I.H.I.          D   C-2-                                                          560       Y4.500           CR  83
37074       29733 JAP MITSUBISHI      JAP O                                                            1940       Y7.400           CL  83
36746       30941 JAP I.H.I.          JAP O                                                            1692       Y7.480           CL  83
37066       31802 JAP SUMITOMO H.I.   JAP O                                                            1800       Y7.550           CL  83
37778       31901 JAP HITACHI ZOSEN   JAP O                                                            1680       Y7.400           CL  83
36781       32779 JAP KAWASAKI H.I.   JAP O                                                            1702       Y7.500           CL  83
37301       33611 JAP I.H.I.          TAI                                                              2390       Y6.600           CL  83
37299       34137 JAP I.H.I.          TAI O                                                            2390       Y6.600           CL  83
37300       34137 JAP I.H.I.          TAI O                                                            2390       Y6.600           CL  83
37001       29730 N   VAN DER GIESSEN NL  C-1-37,C-1-36                                                1444       L20.400          CL  83
33640        5000 R   GALATZ SHPYD.   R   R-1-57                                15900                   394       N62.500          CV  83
36592       38500 S   KOCKUMS M-K.V.  IBN O                                     71500          530  2025       K325.000         CV  83
36593       38500 S   KOCKUMS M-K.V.  IBN                                       71500          530  2025       K325.000         CV  83
36591       40501 S   KOCKUMS M-K.V.  IBN O                                     71500          530  2025       K325.000         CV  83
46233       35596 SK  HYUNDAI H.I.    KWI                                                              1846       U36.000          CN  83
36235       35616 SK  HYUNDAI H.I.    KWI O                                                            1846       U36.000          CL  83
36237       35625 SK  HYUNDAI H.I.    KWI                                                              1846       U36.000          CN  83
36234       35627 SK  HYUNDAI H.I.    KWI                                                              1846       U36.000          CL  83
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TYPE2 ....  DWT... CDY SHIPYARD ....     CDO CARGO HANDLING GEAR.......... GRAIN. BALE.. REEFER VEHS CONIS PSSG N/B PRICE....... VTP 99

36235         35642 SK  HYUNDAI H. I.     KWT                                                           1846      U36.000            CL  83
36238         35642 SK  HYUNDAI H. I.     KWI 0                                                         1846      U36.000            CN  83
36231         35653 SK  HYUNDAI H. I.     KWI 0                                                         1846      U36.000            CL  83
36232         35653 SK  HYUNDAI H. I.     KWI 0                                                         1846      U36.000            CL  83
36542         37897 SK  HYUNDAI H. I.     NL                                                            1800      L21.400            CL  83
36541         38235 SK  HYUNDAI H I.      NL  0                                                         2003      L21.400            CL  83
31728         29790 USA AVONDALE SB.      USA                                              400          2500      U90.000            CL  83
31727         32620 USA AVONDALE SB.      USA                                              400          2500      U90.000            CL  83
37095         25100 D   THYSSEN NSWKF.    D   0-1-40                                                     501      M70.000            CJ  84
36380          7230 DK  FREDERIKSHAVN     DK  R-1-45, R-1-35                       13790               512   414      D105.000           CV  84
36537         32410 F   CH. ATLANTIQUE    F                                                             1400      L19.500            CN  84
37073          7440 GR  SMITHS DOCK       BR  0                                                          464      L18.000            CV  84
39007          6100 JAP TAIHEI KOGYO      TAI                                                            256      U13.000            CN  84
39003          6100 JAP TAIHEI KOGYO      TAI                                                            256      U13.000            CN  84
37707         22500 JAP NIPPON KOKAN      S   0-1-40                                                    1910      U40.000 80/8       CL  84
37203         30124 JAP NIPPON KOKAN      JAP 0                                                         1694      Y7.295             CL  84
37302         43198 JAP I. H. I.          TAI                                                           2240      Y6.600             CL  84
37002         29730 N   VAN DER GIESSEN   NL  C-1-37, C-1-36                                            1414      L20.400            CL  84
37747         35250 S   KOCKUMS MEK. V.   S   R-1-420                                                   2137      K433.000           CV  84
37748         35250 S   KOCKUMS MEK. V.   S   R-1-420                                                   2137      K433.000           CV  84
36147          8770 SF  VALMET, HELSINKI  SU  0                                                          513      S150.000           CJ  84
37422         29000 SK  SAMSUNG SB.       D   0-1-40                                                    1910      U40.000            CL  84
36531         44000 SK  HYUNDAI H. I.     N   C-1-40                               72500               630  2464      U66.600            CV  84
36535         44000 SK  HYUNDAI H. I.     N   C-1-40                               72500               630  2464      U66.600            CV  84
36536         44000 SK  HYUNDAI H. I.     CB  C-1-40                                                   630  2464      U66.600            CV  84

417 ITEMS LISTED.
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CONTAINER VESSELS

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ON ORDER

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TYPE# .... DWT... COY SHIPYARD ..... CDO CARGO HANDLING GEAR......... GRAIN. BALE.. REEFER VEHS CONTS PSBO N/B PRICE....... VTP 99

36706    8000 CHI GUANGZHOU SHPYD USA                                    670  U13.000           CN  83
36707   11100 CHI GUANGZHOU SHPYD USA                                    670  U13.000           CN  83
36148    8770 SF  VALMET.HELSINKI SU  O                                  313  S150.000          CJ  83
37023   38890 SK  DAEWOO SB.      USA O                                 4258  U47.500           CL  83
37538    3150 BR  EST.MAUA        BR  C-2-25                             260  U9.250            CV  84
37539    3150 BR  EST.MAUA        BR  C-2-25                             260  U9.250            CV  84
37540    3150 BR  EST.MAUA        BR  C-2-29                             260  U9.250            CV  84
38960    7200 CHI DALIAN SHPYD.   N                                           U14.000 85/9      CV  84
38961    7200 CHI DALIAN SHPYD.   N                                           U14.000 85/9      CV  84
37068   18000 CHI JIANGNAN SHPYD. SNG C-2-35                             700  U15.000           CL  84
37069   18000 CHI JIANGNAN SHPYD. SNG C-2-35                             700  U15.000           CL  84
37165    7000 DK  FREDERIKSHAVN   DK  R-1-45,R-1-35     13790       312  414  D120.000          CV  84
38014    9200 DK  FREDERIKSHAVN   DK  R-1-45            24050       680  540  D150.000          CV  84
38770   30000 F   CH.ATLANTIQUE   F                                     2400  F362.000          CL  84
38771   30000 F   CH.ATLANTIQUE   F                                     2400  F362.000          CL  84
38060   32410 F   CH.ATLANTIQUE   F                                     1400  L19.500           CN  84
38061   32410 F   CH.ATLANTIQUE   F                                     1400  L19.500           CN  84
37745    3000 GB  APPLEDORE SB.   IS                                     164  L5.500            CP  84
39044   30000 JAP I.H.I.          HK                                    1946  Y5.600 CASH       CL  84
39213   35000 JAP NIPPON KOKAN    S   C-1-40                            1400  U34.000           CV  84
37135   29320 NL  VAN DER GIESSEN NL  O-1-36,C-1-37                     1414  L20.400           CL  84
37439   37000 S   KOCKUMS HHK.V.  S   R-1-420                     600   2137  U60.000           CV  84
36133    6704 SF  RAUMA-REPOLA    S   R-1-50,R-4-10                       65  L16.500           CV  84
37123   25000 SK  SAMSUNG SB.     D   O-1-40                            1910  U40.000           CL  84
39482   33700 SK  SAMSUNG SB.     AUS                                   1930  U26.000           CL  84
37014   38890 SK  DAEWOO SB.      USA O                                 4258  U47.500           CL  84
37015   38890 SK  DAEWOO SB.      USA O                                 4258  U47.500           CL  84
37016   38890 SK  DAEWOO SB.      USA O                                 4258  U47.500           CL  84
37017   38890 SK  DAEWOO SB.      USA O                                 4258  U47.500           CL  84
37018   38890 SK  DAEWOO SB.      USA O                                 4258  U47.500           CL  84
37010   28900 TAI CHINA SB.CORP.  TAI                                   1900  U30.000 80/10     CL  84
37011   28900 TAI CHINA SB.CORP.  TAI                                   1900  U30.000 80/10     CL  84
37020   28900 TAI CHINA SB.CORP.  TAI                                   1900  U30.000 80/10     CL  84
37021   28900 TAI CHINA SB.CORP.  TAI                                   1900  U30.000 80/10     CL  84
39043    6500 BR  EST.CANECO      BR                                          U20.000 90/00     CV  85
39044    6500 BR  EST.CANECO      BR                                          U20.000 90/00     CV  85
39049    6500 BR  EST.CANECO      BR                                          U20.000 90/00     CV  85
39046    6500 BR  EST.CANECO      BR                                          U20.000 90/00     CV  85
38962    7200 CHI DALIAN SHPYD.   N                                           U14.000 85/9      CV  85
38963    7200 CHI DALIAN SHPYD.   N                                           U14.000 85/9      CV  85
37457    9200 DK  FREDERIKSHAVN   DK                                     540  M125.000          CV  85
36015    9200 DK  FREDERIKSHAVN   DK  R-1-45            24050       690  540  D150.000          CV  85
38016    9200 DK  FREDERIKSHAVN   DK  R-1-45            24050       690  540  D150.000          CV  85
38025    9200 DK  FREDERIKSHAVN   DK                    24050       690  540  D175.000 80/8     CV  85
39091    7960 E   JULIANA S.A.    DDR                                    422  U11.000           CN  85
39093    7960 E   JULIANA S.A.    DDR                                    422  U11.000           CN  85
39094    7960 E   JULIANA S.A.    DDR                                    422  U11.000           CN  85
39214   35000 JAP NIPPON KOKAN    N   C-1-40                            1400  U34.000           CV  85
40025   40500 JAP MITSUBISHI      HK                                    2498  Y7.200            CL  85
40026   40500 JAP MITSUBISHI      HK                                    2498  Y7.200            CL  85
39070   42700 JAP ONOMICHI ZOSEN  TAI                                   2390  Y6.300 CASH       CL  85
40057    5500 NL  NIESTERN-SANDER D                                           G20.000           CN  85
37019   38890 SK  DAEWOO SB.      USA O                                 4258  U47.500           CL  85
37020   38890 SK  DAEWOO SB.      USA O                                 4258  U47.500           CL  85
37021   38890 SK  DAEWOO SB.      USA O                                 4258  U47.500           CL  85
37022   38890 SK  DAEWOO SB.      USA O                                 4258  U47.500           CL  85
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TYPE? .... DWT... COY SHIPYARD .      FDD CARGO HANDLING GEAR.......... GRAIN  BALE.. REEFER VEHS CONTS PSSG N/B PRICE....... VTP 99

37024        38990 SK  DAEWOO SB.      USA 0                                                     4258       U47.500          CL  85
37025        38890 SK  DAEWOO SB       USA 0                                                     4258       U47.500          CL  85
37026        38890 SK  DAEWOO SB       USA 0                                                     4258       U47.500          CL  85
37027        38890 SK  DAEWOO SB       USA 0                                                     4258       U47.500          CL  85
40062         9200 DK  FREDERIKSHAVN   DK                                       24050         690   510      D200.000         CV  86
40201         9200 DK  FREDERIKSHAVN   DK                                                                   D185.000         CV  86
40462        40500 JAP MITSUBISHI      HK                                                        2498       Y7.200           CL  86
40463        40500 JAP MITSUBISHI      HK                                                        2498       Y7.200           CL  86
39371        42700 JAP ONOMICHI ZOSEN  TAI                                                       2390       Y6.300 CASH      CL  86
39372        42700 JAP ONOMICHI ZOSEN  TAI                                                       2390       Y6.300 CASH      CL  86
37073        42700 JAP ONOMICHI ZOSEN  TAI                                                       2390       Y6.300 CASH      CL  86

67 ITEMS LISTED.
```

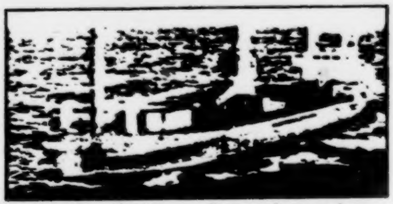
Trend setter in design and size. Evergreen's rough bargaining has forced Far East containership prices down to rock bottom levels

27th January 1983 FAIRPLAY

Container ship

While the previous *Fairplay* "hypothetical" 1,200 TEU containership was not unrealistic we felt that the ship was rather too small, rather too fast and had in fact been largely superseded by at one end "improved" bulker designs and the other multipurpose ships. Our cellular containership then is a vessel of 1,500 TEU, gearless like her predecessors. She is a vessel of 25,000 d.w.t. of 180m l.o.a. 30m breadth and with a maximum draft of 11m. She is fitted with steel pontoon hatches and is able to carry 500 reefer units. Slow speed machinery driving a single propeller and developing 25,000 b.h.p. enables a 20 knot service speed to be maintained. The price for this vessel is $34,200,000.

To those used to the strict estimating procedure adopted with the previous "hypotheticals" we are conscious that all three of these prices might appear on the low side. We nevertheless believe that they are realistic and reflect the sort of prices that are being paid for these ships to a shipbuilding industry that is more concerned with obtaining orders than a proper return. We are indebted to the staff of Fairplay International Research Services (FIRS) for their help in this excercise.



Eminently sellable – small geared general cargo ships like this ex-Mercandian 4,000 d.w.t. vessel have proved good investments for owners in an uncertain market. (FotoFlite picture)

The "new" ships are of types that are acutally being built in some numbers, and look like continuing as types attractive to owners worldwide. The prices reflect *actual* prices that are being paid for *real* ships ordered during 1982 and which will be delivered before the middle of 1984, and include ships that are being built in yards throughout the world. The prices also take into account the various subsidies that in some countries now greatly separate the "estimated" price from what will actually be paid.

A selection of contract values reported in 1982

Sub-type	*Tonnage*	*Country of build*	*Delivery date*	*Price*
Container and Ro-Ro freight				
Container (4148 TEU) (14)	53,000 d.w.t.	S.Korea*	end 83/85	U.S.$780m total
Ro-ro/cont (2400 TEU) (3)	44,000 d.w.t.	S.Korea*	Dec. 83 - Feb 84	U.S.$200m total
Container (2): one geared 1846 TEU and one gearless 2270 TEU	38,290 and 38,580 d.w.t.	Belgium	1984	BF.4,400m total
Ro-ro/cont (2100 TEU) (3)	36,000 d.w.t.	Sweden	1984	SKr. 1,300m total
Geared cont (1910 TEU) (2)	34,000 d.w.t.	S.Korea*	early 84	U.S.$80m total
Container (1900 TEU) (4)	30,000 d.w.t.	Japan*	1983/84	Y.26,400m total
Container (1900 TEU) (4)	30,000 d.w.t.	Taiwan	1984	U.S.$130m total
Geared cont (1800 TEU)	—	Japan*	1984	U.S.$39m
Container (1690 TEU)	31,000 d.w.t.	Japan	1st half 83	Y.7,500m
Container (1500 TEU) (2)	30,000 d.w.t.	Japan	Apr/Jun 83	Y.14,800m total
Container (1400 TEU)	24,000 d.w.t.	Netherlands	Oct 84	G100m
Container (1420 TEU) (2)	27,000 d.w.t.	W.Germany*	1984/85	DM190m total
Container (700 TEU) (2)	—	P.R.China*	1984	US$30m total
Container (600 TEU)	10,350 d.w.t.	W.Germany	1983	DM35m
Ro-ro/cont (520 TEU) (3)	8,500 d.w.t.	Denmark	Dec 84 - Sep 85	DKr.500m total
Ro-ro/cont (one 464 TEU and one 375 TEU)	7,300 and 6,700 d.w.t.	U.K.	end - 83 mid-84	£40m-plus total

APPENDIX B

Vessel Financing Terms

TELEX REC. 120.
LOCAL: 752
TO/À :
DATE :
OPER : RG.

>> TLA037 08/03/84 05:51 <<
*
055-62171 MTL

TLX REF:3283 84-08-03 10:48

8814702BSBLDR G

MARINE CONSULTANTS CANADA

ATTN: LOCAL 752
FOR MR.P.GEORGES
FM BRITISH SHIPBUILDERS, LONDON

IN REPLY YOUR TELEX 752 J3646 OF 2 AUGUST WE CAN ADVISE YOU AS FOLLOWS:-

CREDIT FACILITY AVAILABLE IS LOAN OF 80 PCT CONTRACT VALUE REPAYABLE BY 17 EQUAL HALF YEARLY INSTALMENTS, FIRST PAYMENT DUE 6 MONTHS AFTER DELIVERY. INTEREST RATE 7 1/2 PCT P.A. ON DECLINING BALANCE.

INTEREST ON LOAN DRAWINGS DURING CONSTRUCTION IS TO PURCHASER'S ACCOUNT - PAYABLE ON DELIVERY.

THIS ''PRE-DELIVERY'' INTEREST CAN BE CAPITALISED AND ADDED TO

CONTRACT PRICE IN WHICH CASE ABOVE INTEREST RATE IS INCREASED TO 7 3/4 PCT.

NOTWITHSTANDING FOREGOING, IF THERE IS EVIDENCE OF COMPETITORS BREAKING OECD UNDERSTANDING OUR CREDIT AUTHORITIES WILL CONSIDER MATCHING THEIR OFFER.

HOPE THIS GIVES YOU ALL YOU NEED.

REGARDS
A.KILLIN
*
055-62171 MTL

8814702BSBLDR G

****

APPENDIX C

NATIONAL MARITIME BOARD

Wages, Increments & Supplements

APPENDIX C

PAY RELATED AGREEMENTS - OFFICERS (N.M.B.)

1. On a ship at sea, a seven day week must be worked and rates of pay accordingly have to be related to a seven day week.

Nevertheless, the National Maritime Board recognizes a five-day week and provision is made in the consolidated basic rates of pay for compounded compensation for:

(i) Saturdays and Sundays spent in port;

(ii) Up to 8 hours on Saturdays and 8 hours work on Sundays at sea:

True basic rate for 5 days	100 units
Compounded compensation for:	
Weekend work at sea	35.71 units
Weekends spent in port	11.43 units
Consolidated basic rate	147.14 units

2. Nights on board

An officer instructed to stay on board in port to "keep ship" at night (6 p.m. to 6 a.m.) shall be paid £3.90 for each such night except where there is a company/union agreement for the payment to be consolidated in salary.

3. Supplementary payments

3.1 Stage 1 - Effective 1st June 1976

A supplementary payment at the rate of £6.00 per week or £26.00 per month (subject to the resultant earnings not exceeding £8,500 per annum). The supplement is payable when on Crew Agreement and paid leave (including sick leave, study leave and pay between voyages) but is not to be included in the basic rate for the calculation of supplementary payments such as weekend work in port, limitation of hours or leave liquidation in accordance with N.M.B. requirements

3.2 Stage 2 - Effective 1st June 1977

A supplementary payment of 5% of earnings, subject to a maximum cash limit of £4 per week and a minimum cash limit of £2.50 per week.

The 5% applies to total earnings including the supplementary payment of £ 6.00 per week (£26.00 per month) referred to in Stage 1.

3.3 Self-financing productivity agreement - Effective 1st. September 1977

(a) The total earnings (including the Stage 1 and Stage 2 supplements) are increased by 12 1/2% in recognition of savings in cost through increased productivity in the industry.

b) An additional productivity supplement is payable to senior and intermediate officers as follows:

	%
Master	3.0
Chief Engineer	2.8
Chief Officer	2.0
Second Engineer	2.0
Grade 1 Radio Officer w/12 yrs seniority	2.0
Grade 1 Radio Officer w/less than 12 yrs	1.0
Second Officer	1.0
Third Engineer	1.0
Chief Refrigerator Engineer	1.0
Chief and First Electrical Engineer	1.0
Purser	1.0
Catering Officer	1.0
Chief Steward	1.0

3.4 Stage 3 - Effective 1st November, 1978

Supplementary payment of 10% of total earnings (including the Stage 1 and Stage 2 supplements but excluding the productivity supplements)

3.5 Supplement - Effective 1st November, 1979

Supplementary payment of 17 1/2% of total earnings (including the Stage 1, Stage 2, Productivity and Stage 3 supplements).

3.6 Supplement - Effective 1st November, 1980

Supplementary payment of 12% of total earnings (including supplements 3.1, 3.2, 3.3, 3.4 and 3.5 above).

3.7 Supplement - Effective 1st November 1981

Supplementary payment of 7.7% of total earnings (including supplements 3.1 to 3.6 above).

3.8 Supplement - Effective 1st January 1982

Supplementary payment of 5 1/2% of total earnings (including supplements 3.1 to 3.7 above).

3.9 Supplement - Effective 1st January 1983

Supplementary payment of 5% of total earnings (including the supplements 3.1 to 3.8 above).

Radio Officers' Pay Scale

Class B Vessels (vessels carrying less than 200 persons)

Grade 1 3 yrs service and over and holding 1st or 2nd class, or General Radio Communications Certificate £223.65

Thereafter continuous and unbroken service with one company ranks for seniority pay when the monthly rates are:

1 yr and up to	2 yrs	236.55
2	3	243.75
3	4	251.25
4	5	261.45
5	6	268.80
6	7	276.75
7	8	285.00
8	9	287.55
9	10	292.95
over 21 yrs		325.20

In charge pay, where more than one officer is carried £8.10

ELECTRICAL ENGINEERS' PAY SCALES

Foreign-going monthly rates

	First				
	Begin at	Seniority increments	Second*	Third*	Fourth*
	£p		£p	£p	£p
Single handed ships	247.50	£5.10 per month additional after 3 and 6 years	-	-	-
Two handed ships	260.26		221.10	-	-
Three handed ships	266.85		223.65	204.30	-
Four handed ships	275.40		225.30	204.30	198.90

* Seniority increments:

After 3 years service with a company £4.50 per mth
After 6 years service with a company further £4.50 per mth.

Catering Officers (Certificated) Pay Scales

Foreign-going cargo liners and general traders

Monthly Rate:

Begin at £262.35
Seniority £5.55 per month, additional after 3 and 6 years.

THE NATIONAL MARITIME BOARD PAY SCALES

I. NAVIGATING AND ENGINEER OFFICERS

(1) FOREIGN-GOING CARGO LINERS & GENERAL TRADERS

MONTHLY RATES effective from 1st June, 1975

GROSS TONNAGE	CHIEF ENGINEER OFFICER		FIRST NAVIGATING OFFICER SECOND ENGINEER OFFICER				SECOND NAV. OFF. Cert. of Rank	THIRD ENG. OFF. Uncert.	SECOND NAV. OFF. Superior Certificate THIRD ENG. OFF. Certificated	
			Certificate of Rank		Superior Certificate					
	Begin at	Seniority	Begin at	Seniority	Begin at	Seniority	Fixed Rate	Fixed Rate	Begin at	Seniority
	£p		£p		£p		£p	£p	£p	
501 - 1,000	368.25	£6.15 per month additional Section A Officers after 1, 3, 5 & 7 years Section B Officers after 3, 6 & 9 years	288.60	£5.55 per month additional after 3 and 6 years	311.55	£5.55 per month additional Section A Officers after 1, 3, & 5 years Section B Officers after 3 & 6 years	240.15	230.85	255.00	£5.10 per month additional after 3 years
1,001 - 3,000	378.30		295.50		318.15		241.05	232.65	256.95	
3,001 - 5,000	386.25		301.65		324.45		246.00	235.20	259.80	
5,001 - 7,000	397.05		307.80		332.70		249.60	239.10	263.55	
7,001 - 9,000	409.05		314.85		339.30		253.20	243.45	268.05	
9,001 - 12,000	420.90		321.15		346.95		257.85	247.50	272.10	
12,000 & over	432.45		328.80		353.40		262.35	250.20	276.45	

FOREIGN-GOING CARGO LINERS & GENERAL TRADERS (continued)

MONTHLY RATES

GROSS TONNAGE	THIRD NAV. OFF. Certificated	FOURTH ENG. OFF. Certificated	THIRD NAV. OFFICER FOURTH ENG. OFFICER Uncertificated		FOURTH NAV. OFF. Certificated	FIFTH OR JUNIOR ENG. Certificated	FOURTH NAV. OFFICER FIFTH OR JUNIOR ENGINEER Uncertificated	
	Fixed Rate	Fixed Rate	Begin at	Seniority	Fixed Rate	Fixed Rate	Begin at	Seniority
	£p	£p	£p		£p	£p	£p	
501 - 1,000	219.60	224.10	202.05	£4.50 per month additional after 3 and 6 years (See "Notes on Pay Scales")	—	—	—	£4.50 per month additional after 3 and 6 years (See "Notes on Pay Scales")
1,001 - 3,000	219.60	224.10	202.05		213.00	217.20	195.00	
3,001 - 5,000	219.60	224.10	202.05		213.00	217.20	195.00	
5,001 - 7,000	219.60	224.10	202.05		213.00	217.20	195.00	
7,001 - 9,000	219.60	224.10	202.05		213.00	217.20	195.00	
9,001 - 12,000	225.00	229.35	207.30		213.00	217.20	195.00	
12,001 & over	225.00	229.35	207.30		213.00	217.20	195.00	

PART I—PAY SCALES, DECK AND ENGINE ROOM RATINGS

NATIONAL STANDARD WEEKLY RATES OF PAY

(Effective from 2nd January, 1984)

Category of Rating as rated on the Crew Agreement		Agreement Rate of Pay	Daily Rate of Pay on Leave
		£p	£p
DECK DEPARTMENT			
Carpenter	Begin at	92.60	17.52
	After 2 years	95.90	18.18
	After 4 years	99.17½	18.83½
	After 6 years	105.77½	20.15½
Assistant Carpenter	Begin at	84.00	15.80
	After 2 years	87.32½	16.46½
	After 4 years	90.60	17.12
	After 6 years	97.25	18.45
Chief Petty Officer (Deck)	Begin at	89.52½	16.90½
	After 2 years	92.75	17.55
	After 4 years	96.05	18.21
	After 6 years	102.67½	19.53½
Petty Officer (Deck)		86.77½	16.35½
Seaman Grade 1A		82.00	15.40
Grade 1B		80.40	15.08
Seaman Grade II	Up to 18 years	52.27½	10.45½
	At 18 years	58.42½	11.68½
	At 19 years	62.90	12.58
	At 20 years	74.82½	13.96½
Junior Seaman		42.02½	8.40½
ENGINE ROOM DEPARTMENT			
Plumbers (Single-handed or Senior Plumber where more than one is carried)	Begin at	92.60	17.52
	After 2 years	95.90	18.18
	After 4 years	99.17½	18.83½
	After 6 years	105.77½	20.15½
Other Plumbers	Begin at	91.80	17.36
	After 2 years	95.10	18.02
	After 4 years	98.37½	18.67½
	After 6 years	105.05	20.01
Senior Mechanic	Begin at	91.80	17.36
	After 2 years	95.10	18.02
	After 4 years	98.37½	18.67½
	After 6 years	105.05	20.01
Chief Petty Officer (Motorman)	Begin at	89.52½	16.90½
	After 2 years	92.75	17.55
	After 4 years	96.05	18.21
	After 6 years	102.67½	19.53½
Petty Officer (Motorman)		86.77½	16.35½
Motorman Grade I		82.00	15.40
Motorman Grade II	Up to 18 years	52.27½	10.45½
	At 18 years	58.42½	11.68½
	At 19 years	62.90	12.58
	At 20 years	74.82½	13.96½
Junior Motorman		42.02½	8.40½
Footnote			
Temporary Rating: Motorman Grade 1A *		84.00	15.80

163 March 1984.

PART 2—PAY SCALES - CATERING RATINGS

NATIONAL STANDARD WEEKLY RATES OF PAY

(Effective from 2nd January, 1984)

CARGO LINERS (EXCLUDING THOSE WITH ACCOMMODATION FOR 6 OR MORE PASSENGERS) AND GENERAL TRADING VESSELS

Category of Rating as rated on the Crew Agreement and where carried		Agreement rate of pay	Daily rate of pay on leave
		£ p	£ p
STEWARDS' DEPARTMENT			
Chief Steward/Stewardess	Begin at	102.67½	19.53½
	After 2 years	106.00	20.20
	After 4 years	109.27½	20.85½
	After 6 years	115.85	22.17
Second Steward/Stewardess		82.00	15.40
Steward/Stewardess		78.80	14.76
Junior Catering Rating:			
Less than 9 months service		42.02½	8.40½
Over 9 but under 18 months service		44.27½	8.85½
18 months service and over		50.12½	10.02½
GALLEY DEPARTMENT			
Chief Cook/Cook Steward	Begin at	89.52½	16.90½
	After 2 years	92.75	17.55
	After 4 years	96.05	18.21
	After 6 years	102.67½	19.53½
Second Cook		84.00	15.80
Cook Assistant		79.72½	14.94½
Junior Catering Rating:			
Less than 9 months service		42.02½	8.40½
Over 9 but under 18 months service		44.27½	8.85½
18 months service and over		50.12½	10.02½

164 March 1984.

PART 9—CADETS PAY AND CONDITIONS

PAY

(1) Annual Rates of Pay (Minima and Maxima)

SERVICE	Age on Entry						
	Under 17½	17½	18	18½	19	19½	20
	£ p	£ p	£ p	£ p	£ p	£ p	£ p
Basic at	2406 22	2506 76	2712 59	2792 46	2846 31	2966 01	3020 33
After 1 year	2810 43	2922 45	2975 75	3064 00	3166 00	3250 17	3310 64
After 2 years	3118 01	3201 28	3260 65	3345 74	3439 60	3533 37	3597 83
After 3 years	3392 20	3481 58	3544 60	3696 60	3760 45	3860 36	3932 06
After 4 years	3703 38	3802 22	3912 24	4013 33	4084 35	4187 33	4270 84

(Effective from 1st November 1983)

NOTE. The above pay scale includes the following pay policy supplementary payments:

(a) Stage 1 (Effective 1st June, 1976)

Cadets under 17½ years of age	: begin at rate	£286 p.a.
Cadets 17½ years of age	: begin at rate	£299 p.a.
Cadets 18 years of age and over	: all rates	£312 p.a.

The payment is not to be consolidated in the basic rate. It is payable when on Crew Agreement and paid leave but is not to be included in the calculation when leave is liquidated.

(b) Stage 2 (Effective 1st June, 1977)

A supplementary payment of 5% of earnings subject to a minimum of:
£2.50 p.w. in respect of Cadets aged 18 years and over.
£1.50 p.w. in respect of Cadets under 18 years of age.

(c) Self-financing Productivity Agreement (Effective 1st November 1977)

A supplement of 7½% of total earnings in recognition of the circumstances as set out in Part 1 Clause 13(3)(a).

(d) Stage 3 (Effective 1st November, 1978)

A supplementary payment of 10% of total earnings (including the Stage 1 and Stage 2 supplements but excluding the productivity supplement).

(e) Supplement—Effective 1st November, 1979

A supplementary payment of 17½% of total earnings (including the Stage 1, Stage 2, Productivity and Stage 3 Supplements).

160 March 1984.

(f) Supplement—Effective 1st November, 1980

A supplementary payment of 12% of total earnings (including the supplements (a) to (e) above).

(g) Supplement—Effective 1st November, 1981

A supplementary payment to be added to total earnings (including the supplements (a) to (f) above) as follows:

Age Columns		
Under 17½	—	4%
17½ and 18	—	5%
18½ and 19	—	6%
19½, 20 or over	-	7%

(h) Supplement – Effective 1st November, 1982

A supplementary payment of 5½% to be added to total earnings (including the supplements (a) to (g) above).

(i) Supplement – Effective 1st November, 1983

A supplementary payment of 5% to be added to total earnings (including the supplements (a) to (h) above).

(2) Navigating Cadets' Remuneration

When promoted to uncertificated officer during their cadetship, navigating cadets shall receive the same benefits for the period of such service as other uncertificated officers would receive under a Section A or B Agreement.

(3) North & Central American Coastal Trade Bonus

It is recommended that Cadets should receive a North and Central American coastal trade bonus of an additional payment of £13.80 per month in the last two years of service; an additional £6.90 per month being paid up to that time. The payment to be made subject to the conditions of Clause 10 of Part, 1. *(Effective from 1st May, 1968)*

160 March 1984.

OFFICERS WAGES - National Maritime Board

Includes Adjustments and Increments to 1984

£ (Sterling)

	Master	Chief Officer	2nd Officer	3rd Officer	Chief Engin.	2nd Engin.	3rd Engin.	4th Engin.	Elect. Engin.	Chief Steward	Radio Operator	Cadet	Cadet
		per mth	per mth								per mth	per yr	
Basic rate		328.80	262.35	207.3	432.45	328.80	250.20	207.30	247.50	262.35	223.65	2,406.72	2,406.72
Certificate pay		24.60	14.80	17.7	-	24.60	26.25	22.05	-	-	-	-	-
Seniority increments		16.65	5.10	-	24.60	16.65	5.10	-	10.20	11.10	45.15	1,296.66	1,296.66
Salary / Month		370.05	281.55	225.00	457.05	370.05	281.55	229.35	257.70	273.45	268.80	308.62	308.62
Salary / Year		4,440.60	3,378.60	2,700.00	5,484.60	4,440.60	3,378.60	2,752.20	3,092.40	3,281.40	3,225.60	3,703.38	3,703.38
Limitation of hours													
Weekend work in port		1,167.94	888.62	710.14	1,442.52	1,167.94	888.62	723.87	813.34	863.05	848.38	974.04	974.04
Nights on board													
Cargo handling													
Leave pay		2,518.37	1,916.00	1,531.23	3,110.44	2,518.37	1,916.00	1,560.84	1,753.77	1,860.96	1,829.31	852.28	852.28
Leave food allow.													
Total per year		8,126.91	6,183.22	4,941.37	10,037.56	8,126.91	6,183.22	5,036.91	5,659.51	6,005.41	5,903.29	5,529.70	5,529.70
1. Add £26/mo.		8,438.90	6,495.22	5,253.37	10,349.56	8,438.90	6,495.22	5,348.91	5,971.51	6,317.41	6,215.29		
2. " 5% of earn.in 98		8,860.85	6,819.98	5,516.04	10,867.04	8,860.85	6,819.98	5,616.35	6,270.09	6,633.28	6,526.06		
3. " 12 1/2% + 26%		10,145.68	7,740.68	6,205.55	12,529.70	10,145.68	7,740.68	6,318.40	7,116.55	7,528.77	7,407.08		
4. " 10% of line 2		886.07	682.00	551.60	1,086.70	886.09	682.00	561.64	627.01	663.33	652.61		
		11,031.77	8,422.68	6,757.15	13,616.40	11,031.77	8,422.68	6,880.04	7,743.56	8,192.10	8,059.69		
5. " 17 1/2%		12,962.32	9,896.65	7,939.66	15,999.27	12,962.32	9,896.65	8,084.04	9,098.68	9,625.72	9,470.13		
6. " 12%		14,517.80	11,084.24	8,892.41	17,919.19	14,517.80	11,084.24	2,054.13	10,190.52	10,780.80	10,606.55		
7. " 7.7%		15,635.67	11,937.73	9,577.13	19,298.97	15,635.67	11,937.73	9,751.29	10,975.19	11,610.92	11,423.25		
8. " 5.5%		16,495.64	12,594.31	10,103.87	20,360.41	16,495.64	12,594.31	10,287.61	11,578.83	12,249.52	12,051.53		
9. " 5%		17,320.42	13,224.02	10,609.06	21,378.43	17,320.42	13,224.02	10,802.00	12,157.77	12,862.00	12,654.11	5,529.70	5,529.70

Officers: 207 days leave

Cadets: 84 days leave

RATINGS WAGES - National Maritime Board

(Sterling)

	Bosun	A.B.	A.B.	A.B.	Oiler	Oiler	Oiler	Chief Cook	Steward	Junior Rating (catering)	Junior Rating (catering)
Basic Rate	86.775	80.40	80.40	80.40	82.00	82.00	82.00	89.525	82.00	42.025	42.025
Seniority increment	-							13.15	-	8.10	8.10
Salary / wk	86.775	80.40	80.40	80.40	82.00	82.00	82.00	102.675	82.00	50.125	50.125
Salary / mth	375.74	348.13	348.13	348.13	355.06	355.06	355.06	444.58	355.06	217.04	217.04
Salary / yr	4,508.83	4,177.58	4,177.58	4,177.58	4,260.72	4,260.72	4,260.72	5,334.99	4,260.72	2,604.50	2,604.50
Weekend work/port	1,570.08	1,447.68	1,447.68	1,447.68	1,478.40	1,478.40	1,478.40	1,875.36	1,478.40	962.40	962.40
Leave pay	1,112.14	1,025.44	1,025.44	1,025.44	1,025.44	1,047.20	1,047.20	1,328.38	1,047.20	681.70	681.70
Total	7,191.05	6,650.70	6,650.70	6,650.70	6,786.32	6,786.32	6,786.32	8,538.73	6,786.32	3,635.60	3,635.60

68 days leave per annum

APPENDIX D

Port Charges - Montreal

Second Revised Page 43
(With corrections dated
April 30, 1984)

PORT OF MONTREAL, QUEBEC

PORT EXPENSES

1. **PILOTAGE:** See Schedule under "Pilotage - St. Lawrence River", Page 85.

2. **BOATMEN:** See tariffs immediately following on Page 45.

3. **TOWAGE:** See Schedule on Page 46.

4. **HANDLING LINES:**
08:00 hrs. to 24:00 hrs. ------------- $ 830.00
00:00 hrs. to 07:59 hrs. ------------- 907.00
Saturdays, Sundays & Holidays -------- 1317.00
Surcharge --------------------------- 50%

5. **HARBOUR DUES:**
a) Canadian registered vessels in coastal trade ---------------- 1.93¢ per G.R.T.
b) All other vessels ------------ 3.89¢ per G.R.T.
c) Minimum charge for (a) ------- $ 12.68
d) Minimum charge for (b) ------- $ 25.37

6. **DOCKAGE CHARGES:**
a) 3.22¢ per G.R.T. for first 12 hour period or part thereof.
b) 3.22¢ per G.R.T. for second 12 hour period or part thereof.
c) 1.94¢ per G.R.T. for each succeeding 12 hour period or part thereof.
Minimum charge ---------------------- $ 25.37

7. **CUSTOMS & EXCISE**
Special service - overtime
First 2 hours or part thereof - $ 50.00 per hour
Each additional hour - $ 25.00

8. **SHIPPING FEDERATION DUES:** See Schedule on Page 9.

9. **FRESH WATER:**
Water charge, per tonne ------------- $ 0.448
Service charge, per period of 72 hours or part thereof:
a) weekdays 0800 - 2400 hours ------- $ 127.20
b) weekdays 0000 - 0800 hours and Saturdays ---------------------------- 189.47
c) Sundays and Holidays ------------- 253.07

10. **GARBAGE REMOVAL:**
Requested service available at anchorage (Seaway bound vessels)
1983
Pointe-aux-Trembles anchorage -------- $ 130.00
Montreal East anchorage -------------- 145.00
Canadian Vickers anchorage ----------- 160.00
For alongside ships, containers located each berth - per vessel, per day ----- 11.66

12. **ELECTRICITY:**

1. Electric installations ------ Cost to the Board
2. Electric power supplied at low voltage:
   - a) per kilowatt of billing demand exceeding 20 kilowatts ------- $ 6.97
   - b) plus per kilowatt hour for the first 6,270 kilowatt hours --- 0.059
   - c) plus per kilowatt hour for the remaining consumption -------- 0.029
3. Minimum monthly charge ----------- $ 17.37

13. **AGENCY FEES:** See Schedule on Page 7.

14. **PORT WARDEN FEES:** See tariff of fees on Page 47.

15. **M.E.A. ASSESSMENTS:** See Schedule on Page 107.

MARITIME EMPLOYERS' ASSOCIATION (SHORE LABOUR) ASSESSMENTS FOR JOB SECURITY & ADMINISTRATION

Montreal, Quebec, Three Rivers

	Metric Weight Ton 2,204.6 lbs.	Metric Ton Measure 1 cubic meter
Conventional Cargo	$ 2.15	$ 1.72
Conventional cargo in technologically advanced ships	2.96	2.38
Modular homes in Conventional ships	10.73	
Containers	3.47	
Modular homes in technologically advanced ships	14.77	
Grain	.10	
Bulk	.20	
Automobiles in technologically advanced ships	2.72 per unit	
Automobiles in conventional ships	1.94 per unit	

Effective January 1, 1983

MONTREAL, QUEBEC - WHARFAGE CHARGES

	Description of Goods	Rate in $
a)	All goods N.E.S.	2.25/tonne 1.81/cu.metre
b)	Asbestos	.91/tonne .74/cu.metre
c)	Fish, fresh or processed	1.19/tonne .96/cu.metre
d)	Fruit, vegetables and meat, fresh or processed	1.02/tonne .80/cu.metre
e)	Grain and grain products N.E.S.	.59/tonne .51/cu.metre
f)	Jute and jute basic products	1.63/tonne 1.32/cu.metre
g)	Lumber and logs, rough or dressed	.59/tonne .45/cu.metre
h)	Rubber, natural or synthetic	1.34/tonne 1.09/cu.metre
i)	Sugar, raw or refined	1.12/tonne .91/cu.metre
j)	Fluorspar, fertilizer, feldspathic materials in bags or containers, scrap metal	1.02/tonne .80/cu.metre
k)	Basic and primary metallic products, ores and concentrates in containers or on pallets or skids	1.81/tonne 1.43/cu.metre
l)	Coal, coke, sand, gravel and stone	.36/tonne .30/cu.metre
m)	Alcoholic beverages	8.96/tonne 7.18/cu.metre
n)	Newsprint, woodpulp and basic or primary paper products	.91/tonne .74/cu.metre
o)	Building board, veneers, plywoods, wallboard and wall panelling	1.02/tonne .80/cu.metre
p)	Goods in standard cargo containers	2.25/tonne
q)	Grain and grain products in bulk handled through elevators	.25/tonne
r)	Dry bulk commodities N.E.S.	.75/tonne
s)	Gypsum in bulk	.44/tonne
t)	Petroleum oil, crude or refined including gasoline and similar products in bulk	.44/tonne
u)	Liquid products N.E.S. in bulk	1.34/tonne
v)	Self propelled four wheel motor vehicles	
	i) 1815 kg or under	6.72 each
	ii) over 1815 kg to 2725 kg	13.55 each
	iii) over 2725 kg	2.25/tonne 1.81/cu.metre
w)	Livestock	1.35 each
x)	Bauxite and manganese ores	.55/tonne

Effective: January 1, 1984

MONTREAL HARBOUR TARIFF

TOWAGE

	Tug(s) ordered 12 hours or more in advance	Tug(s) ordered with less than 12 hours notice
SHIP DOCKING & UNDOCKING		
1. Between the upper side of Sutherland Pier and Windmill Point ------------	$ 512	$ 852
2. Between the lower side of Sutherland Pier and Section 71 ----------------	664	1107
3. Between Section 72 and Pointe-aux-Trembles Anchorage -----------------	765	1278
SHIP MOVAGES		
1. Between Berth No. 19 and Windmill Point -	562	938
2. Between the upper side of Sutherland Pier and Windmill Point ------------	664	1107
3. Between Section 71 and Windmill Point -	777	1295
4. From Seaway Entrance Channel to any part of Harbour -------------------	1115	1856
5. Between Montreal East and Windmill Point -----------------------------	1115	1856
6. From any dock outside Canadian Vickers Basin to Vickers Dry Dock or vice-versa -	1022	1703

CANCELLATION, REPORTING & DETENTION

a) Tugs ordered 12 hours or more in advance:

When tug(s are ordered 12 hours or more in advance, the time indicated may subsequently be adjusted as necessary without charge. However, if the tug(s) are eventually cancelled, a charge of $131.00 per tug will apply.

b) Reporting and Detention:

When a tug is cancelled after having been dispatched to a ship a flat charge of $131.00 per tug will be assessed, and when a tug is delayed, moored alongside a vessel, a detention charge of $131.00 per tug per half-hour after the first half-hour will be charged. Reporting and detention charges will not apply if caused by traffic congestion, in accordance with those terms as set forth by the Shipping Federation of Canada letter dated October 5, 1961.

WINTER RATES:

Winter rates are in effect from January 1st to March 15th inclusive and are double those shown above for the first column and 60% more for the second column.

PORT WARDEN, HARBOUR OF MONTREAL

TARIFF OF FEES

1.	Clearing of:-	
	a) Vessels with cargo, export	$ 40.00
	b) Coastwise vessel with cargo	10.00
2.	Damaged goods on dock or ship	
	a) First examination	50.00
	b) Each subsequent examination	25.00
	c) Report with certificate	75.00
3.	Note of protest	
	a) Port Warden attending	50.00
	b) Master presenting	35.00
4.	Grain	
	a) i Preliminary, Full grain	35.00
	ii Pass for full grain	50.00
	iii Final survey clearance	.02/metric ton 50.00 Min. 300.00 Max.
	b) Loading Certificate for topoff	50.00
	c) Part grain - completing with general	40.00
	d) Securing of bulk grain	40.00
	e) Dunnage and separations, each visit	25.00
5.	General Cargo	
	a) Opening of hatches and cargo in sight, Import	25.00
	b) Refrigerated cargo, checking of temperatures Import	40.00
	c) Survey prior to loading, Export	
	i General cargo	30.00
	ii Dry and perishable	40.00
	d) i Sighting the securing of cargo in progress	25.00 /visit
	ii Final with certificate	40.00
	e) Timber on deck	
	i Readiness to load	40.00
	ii Final with certificate	40.00
	f) Concentrates	
	i Readiness to load	40.00
	ii Fitness to proceed	40.00
6.	Measurement of Freeboard	50.00
7.	Measurement of Vacant Space Remaining with Certificate	75.00
8.	Attendance to Vessels at Anchor	
	Lanoraie	100.00
	Contrecoeur Wharf	75.00
	Longue Pointe or Pointe Aux Trembles	50.00

9.	Attending Vessels to Advise: Securing of cargo, Stability, Fittings, etc.	$ 25.00
10.	Additional Fee for Services rendered outside regular office hours.	45.00/hour

Any services or inspections not covered by tariff to be by prior mutual agreement. Any extra items, e.g., Photographs to be at cost.

Agency Fees

ADIAN GREAT LAKES, ST. LAWRENCE, ATLANTIC PORTS

SCHEDULE A - BASIC FEES

DRY CARGO VESSELS

1. Discharging only, or loading only, full or part cargo: including lightening and/or shifting cargo for seaway draft	
(a) cargoes not exceeding 5,000 tonnes	1630
(b) over 5,000 tonnes	1965
(c) over 10,000 tonnes	2245
(d) over 20,000 tonnes	2525
(e) over 40,000 tonnes	2805
(f) over 80,000 tonnes	3085
(g) over 160,000 tonnes	3370
2. Discharging and loading full or part cargo (same agent, same port): For each operation, above fees less 25%.	
3. Supervisory services. Acting on behalf of owners when vessel consigned to charterers agent or acting on behalf of charterers when vessel consigned to owners agent: 60% of fees as per item 1 or 2 and all surcharges.	
4. Owners agency (time chartered vessel). Attending to husbandry matters on behalf of owners for vessels on time charter; per port.	1065
5. Vessel calling for:	
(a) orders and/or bunkers only	810
(b) delivery or re-delivery only	810
(c) drydocking only	980
(d) fitting or securing for grain or other bulk cargo only	980
(e) cleaning for grain or other bulk cargo only	980
6. Additional daily fee to be assessed on all the above items after the first three (3) days.	110
7. (a) Attendance on vessels transitting Seaway westbound	1010
(b) Attendance on vessels transitting Seaway eastbound	1010
(c) Vessels stopping at Montreal either before transitting Seaway westbound or after transitting Seaway eastbound for purposes of installing or removing Seaway fittings (excluding radio telephones)	615

8. Supervising, coordinating and accounting services performed by Montreal General Agent in connection with vessels calling at U.S. and Canadian Great Lakes Ports.	
(a) per port	450
(b) minimum per Great Lakes round voyage	615

LIQUID CARGO VESSELS

9. 80% of items 1 and 2 except for those vessels carrying multiple parcels.

SCHEDULE B - ADDITIONAL FEES

1. When vessel required to call at more than two berths in any one port, under the same agent - for each extra berth	225
2. When agent is required to arrange:	
(a) delivery or re-delivery	405
(b) drydocking	505
(c) fumigation	405
(d) fumigation and crew accomodations	810
(e) fitting or securing for grain or other bulk cargoes	605
(f) cleaning for grain or other bulk cargoes	505
(g) scrap cargo	by arrangement
(h) over 5 Bills of Lading - per additional B/L	by arrangement
3. When attention required after vessel's departure:	
(a) stowaways and crew members missing or deserting - minimum per man	225
(b) crew members remaining in hospital per man - first seven days or part thereof	225
- per week thereafter	110
4. Fees for attending crew change (per operation)	
(a) first person	95
(b) for each additional person	50
(c) 10 to 25 persons (lump sum)	505
(d) 26 persons and over	by arrangement

URCHILL, MANITOBA

At the port of Churchill, the applicable fees will be 120% of the fees specified in schedule "A" and schedule "B" above.

TIVE: Vessels arriving on or after
August 1, 1983.

THE SHIPPING FEDERATION OF CANADA

DUES STRUCTURE

Liner Vessels - 2¢ per gross registered ton, payable on a maximum of seven voyages per calendar year.

Minimum charge - $ 75.00
Maximum charge - $225.00

Transient Vessels - 1.75¢ per gross registered ton, payable on a maximum of seven voyages per calendar year.

Minimum charge - $ 75.00
Maximum charge - $200.00

Interprovincial Vessels - 3¢ per gross registered ton per calendar year.

Minimum charge - $ 75.00

Cruise Vessels - $150.00 per voyage

A minimum fee of $300 per member per calendar year is applicable.

Vessels having two gross registered tonnages will be assessed on the lower gross registered tonnage.

Effective: March 1, 1984

PILOTAGE - ST. LAWRENCE RIVER

The following are the Laurentian Pilotage Tariff Regulations, which become effective April 1, 1980. These Regulations are compulsory for most vessels transitting the St. Lawrence River.

"Authority"	means the Laurentian Pilotage Authority.
"berth"	includes a wharf, pier, anchorage, mooring buoy or a berthed ship.
"breadth of the ship"	means the maximum distance, metres and centimetres, to the outside of the shell plating of the ship.
"dead ships"	means a ship normally self-propelled that is without the use of its propelling power and that is under tow, but does not include a ship warped from one berth to another solely by means of mooring lines attached to a wharf, to the shore or to a mooring buoy, or a ship stopped on account of ice.
"district"	means District No. 1, District No. 101, District No. 2 or District No. 3, as the context may require.
"District No. 1"	means all waters between the northern entrance to St. Lambert Lock and a line drawn across the St. Lawrence River at Longitude 71°08'W.
"District No. 1-1"	means all waters between the northern entrance to St. Lambert Lock and a line running east and west across the St. Lawrence River at the northernmost tip of Ile Ste-Thérèse.
"District No. 2"	means all waters between a line drawn across the St. Lawrence River at Longitude 71°20'W and a line drawn across the St. Lawrence River bearing 121° (True) at Latitude 48°20'N and Longitude 69°23'24"W, including the Saguenay River.
"District No. 3"	means all waters of the Region of the Authority not included within the limits of District 1, District No. 1-1 and District No. 2.
"docking"	means the manoeuvring of a ship to a berth when the pilot is replaced by another pilot pursuant to section 5 of Schedule II following completion of a trip.
"draught"	means the greatest depth of the submerged part of the ship, in metres and centimetres, at the time pilotage services are performed.
"length of the ship"	means the distance, in metres and centimetres, between the fore and aft extremities of the ship.
"movage"	means the piloting of a ship within a harbour described in Schedule II, whether the ship is moved from one berth to another or is returned to the same berth, but does not include a) when a pilot has not been relieved i) the piloting of a ship from an anchorage to a berth or another anchorage, or

ii) the manoeuvring where the ship is leaving the wait wall at St. Lambert Lock to enter the lock or vice versa, or

b) unless a pilot is employed, the warping of a ship from one berth to another solely by means of mooring lines attached to a wharf, to the shore or to a mooring buoy.

"pilot boat" means a boat employed in the service of the Authority to embark or disembark pilots.

"pilotage unit" means, in respect of any ship, the result obtained by multiplying the squared breadth of the ship, in metres and centimetres, by the depth of the ship, in metres and centimetres, and by dividing the product by 100, the said result to be rounded to the nearest hundredth.

"time factor" means the result obtained by multiplying the draught of a ship, in metres and centimetres, by the number of hours or part thereof during which the ship is underway under the conduct of a licensed pilot, but does not include any time during which the ship is compelled to remain stopped or is actually unable to move on account of ice or any period of time during which charges pursuant to sections 9 and 10 of Schedule II may be assessed.

"trip" means the piloting of a ship from one point to another within the Region of the Authority, but does not include

(a) a movage, or
(b) a docking or undocking, where a pilot replaces another pilot pursuant to section 5 of Schedule II.

"undocking" means the manoeuvring of a ship from a berth when the pilot is replaced by another pilot pursuant to section 5 of Schedule II prior to the commencement of a trip.

"unit" means pilotage unit.

1. Pilotage Charges

(1) The charges set out in Schedule II are hereby prescribed as pilotage charges that are payable to the Authority.

(2) Except in the case of a pushing vessel pushing one or more ships, scows or barges, the unit charges set out in sections 1 to 5 of Schedule II shall, in respect of a ship having less than 25 units, be the same as for a ship having 25 units.

2. (1) Where the services of more than one pilot are used in performing a pilotage service, the pilotage charge shall be multiplied by the number of pilots used in performing the service.

(2) Where the owner, master or agent of a ship specifically requests, for a trip or a movage, the services of a pilot holding a license of a class that is superior to that required for that trip or movage by the Laurentian Pilotage Authority Regulations, the pilotage charge payable for that trip or movage shall be increased by 100 per cent.

3. (1) Where a tug is towing one or more unmanned barges, scows or ships and two pilots are on board the tug, the pilotage charges set out in Schedule II are payable in respect of

a) the tug, whether or not it is assisted by another tug; and
b) each unmanned barge, scow or ship towed.

(2) Where a tug is towing a manned barge, scow or ship and two pilots are on board the tug and two pilots are on board the barge, scow or ship, charges equal to double the pilotage charges set out in Schedule II are payable in respect of

a) the tug; and
b) the barge, scow or ship.

(3) Where several tugs are towing a manned barge, scow or ship and two pilots are on board the leading tug, two pilots are on board an assisting tug and two pilots are on board the manned barge, scow or ship, charges equal to double the pilotage charges set out in Schedule II are payable in respect of

a) the leading tug;
b) the assisting tug; and
c) the manned barge, scow or ship.

(4) Where a tug is pushing a barge or scow and two pilots are on board the tug, the pilotage charges set out in Schedule II are payable.

a) in respect of the tug, on the basis of the actual units of the tug; and
b) subject to subsection 3(2), in respect of the barge or scow.

Pilotage Cards

1) On boarding a ship, the pilot shall ascertain from the master or officer-in-charge of the ship the breadth, depth, length, registered tonnage and other information necessary to complete the pilotage card supplied by the Authority.

2) A completed pilotage card shall be signed by the master or officer-in-charge of the ship and by the pilot and shall be delivered by the pilot to the Authority without alteration as soon thereafter as is practicable.

3) Where the master or officer-in-charge of a ship fails to provide the pilot with the information specified in subsection (1), or where, on request from the Authority, the owner or agent fails to provide that information to the Authority, information published by an appropriate Classification Society shall, subject to subsection (4) be used by the Authority.

4) Where the information published by an appropriate Classification Society is not sufficient for the purpose of completing the pilotage card, the Authority shall, on request by the agent, contact the Classification Society in order to obtain such information as is necessary for that purpose.

5) Where the information specified in subsection (1) cannot be obtained in the manner described in subsection (3) and (4) the ship is subject to the same charges as a ship of 500 units.

6) Where there is a descrepancy between information obtained from a Classification Society and the information provided by the master or officer-in-charge of a ship, the information obtained from a Classification Society shall be used, but if it is established that any charges were based on incorrect information, the charges shall be adjusted accordingly.

Trip Rules

1) A one way trip commences from such time as the ship is underway;

   a) after the pilot has boarded the ship.
      i) on entry into the region;
      ii) at a port or place within the region, unless the pilot has boarded,
         A) at Three Rivers when the ship is in transit;

        B) to perform a docking or undocking, or
        C) to perform a movage, or
    iii) to replace a pilot who has performed an undocking:
- b) having the same pilot on board after the ship was previously,
    - i) secured at a wharf or pier in a harbour or to another ship,
    - ii) anchored to load, discharge, trim cargo, ballast, embark or disembark passengers or owing to a mechanical defect, or
    - iii) anchored for inspection or in waiting for a berth, or
- c) having the same pilot on board after the ship has completed a change of course of more than 120 degrees, except
    - i) for entering or leaving a berth,
    - ii) for anchoring,
    - iii) for compass adjusting,
    - iv) when due to ice, adverse weather conditions of a grounded ship, or
    - v) to enter or leave the Saguenay River without change in destination.

2) A one way trip terminates when
- a) the ship enters St. Lambert Lock;
- b) the ship leaves the region;
- c) the pilot leaves the ship, except at Trois Rivieres when there is a change of pilot for a ship in transit;
- d) the ship is secured to a wharf or pier in a harbour unless the ship is secured at the wait wall at St. Lambert Lock;
- e) the ship is secured to another ship;
- f) the ship anchors to load, discharge, trim cargo, ballast, embark or disembark passengers or owing to a mechanical defect;
- g) the ship anchors for inspection or to wait for a berth;
- h) a pilot embarks to perform a docking; or
- i) the ship has completed a change of course of more than 120 degrees, except
    - i) for entering or leaving a berth
    - ii) for anchoring
    - iii) for compass adjusting
    - iv) when due to ice, adverse weather conditions or a grounded ship, or
    - v) to enter of leave the Saguenay River without change in destination.

SCHEDULE I

Charges for Movages

1. 1) The pilot charge for a movage is $182.00 plus $2.59 per unit.

   2) Where a ship anchors during a movage, a charge of $166.00 is payable in addition to any other applicable charges.

Charges for Trips

2. 1) The pilotage charge for a one way trip is
      a) in District No. 1 is $14.09 per unit plus $6.78 per time factor; and
      b) in District No. 2 is $9.54 per unit plus $4.85 per time factor.
   2) Where a ship anchors during a trip, a charge of $166.00 is payable in addition to any other applicable charges.

Charges for General Pilotage

3. Where the services of a pilot are required for a trip in District No. 3, the pilotage charge is $1.05 per unit plus $1.81 per time factor.

Charges for Trial Trips

4. 1) The pilotage charge payable for ship movements required for trial trips are as follows:

      a) In District No. 1, the charges prescribed by paragraph 2(a);
      b) In District No. 2, the charges prescribed by paragraph 2(b);
      c) In District No. 3, the charges prescribed by paragraph 3.

   2) In addition to the pilotage charges specified in subsection (1), a pilotage charge of $142 is payable in respect of:

      a) each anchor trial; and
      b) one or more rudder trials.

Charges for Docking

5. 1) Where the owner, master or agent of a ship makes a specific request to the Authority for the services of a pilot holding qualifications higher than required for the ordinary conduct of the vessel, to undertake the docking or undocking of a ship, the pilotage charge is $182 plus $1.54 per unit, in addition to any other applicable charges prescribed by this schedule.

2) The qualifications referred to in subsection (1) may take the form of either a license of a higher class, or a certificate issued by the Authority attending to the higher experience and training of the pilot.

Dry Docks

6. In addition to any other pilotage charges prescribed by this schedule, a pilotage charge of $142 is payable where a pilot conducts a ship into or out of a dry dock, floating dock, graving dock or on or off a cradle.

Dead Ships

7. The pilotage charge payable for the pilotage or movage of a dead ship is an amount equal to one and one-half times the pilotage charge that would have been payable for the pilotage or movage of that ship.

Compass Adjusting

8. The pilotage charges payable for a ship movements required for adjusting the ship's compasses or calibrating the ship's direction finders are:

a) for a period of three hours or less ----- and	$142.00
b) for each hour or part thereof in excess of three hours -------------------------	34.00

Detention in Transit

9. 1) Where, after being underway, a ship is berthed, at anchor, compelled to remain stopped or is actually unable to move on account of ice or is aground at any place within a district, a pilotage charge of $34.00 is payable, subject to subsection (2), for each hour or part thereof that a licensed pilot for the district is required by the master or agent of the ship to stand by on board for reasons of safety of the ship while the ship is so berthed. anchored, compelled to remain stopped or unable to move or aground.

2) The maximum charge payable under subsection (1) for any twenty-four hour period is $340.00

Detention on Board Ship

10. 1) Where a pilot is detained on board ship at a wharf or pier for more than one hour, pilotage charges not exceeding $240.00 per day are payable as follows:

a) for the first hour of detention or part thereof ---------------------------- no charges
b) for the second hour of detention or part thereof ---------------------------- $ 48.00 and
c) for each subsequent hour of detention or part thereof ---------------------- 24.00

2) Notwithstanding subsection (1), the pilotage charges specified in that subsection are not payable where a pilot is detained on board any ship situated north of the northern entrance to St. Lambert Lock during the period from the 16th day of March to the 31st day of December in any year for reasons of

a) stress of weather;
b) adverse tidal conditions; or
c) adverse ice conditions.

Detention on Shore

11. 1) Where, after a pilot's services have been requested, the pilot reports for pilotage duty at a pilot station and is detained at that pilot station for more than one hour, pilotage charges not exceeding $240.00 per day are payable as follows:

a) for the first hour or part thereof --- no charges
b) for the second hour or part thereof -- $ 48.00 and
c) for each subsequent hour or part thereof ----------------------------- 24.00

2) For the purpose of subsection (1), detention of a pilot commences at

a) the time for which the pilot was ordered to report to the pilot station for pilotage duty, or
b) the time the pilot actually reported at the pilot station for pilotage duty, whichever is the later time.

3) Notwithstanding subsection (1), the pilotage charges specified in that subsection are not payable during the period from the 16th day of March to the 31st day of December in any year.

Cancellations

12. 1) Where a request for pilotage services is cancelled after a pilot reports pursuant to that request, a pilotage charge of $84

2) In addition to the pilotage charge specified in subsection (1) and subject to subsection (3), where a request for pilotage services is cancelled more than one hour after the pilot is ordered to report pursuant to that request, a pilotage charge of $24 is payable for each hour or part thereof from the time for which the pilotage services were requested, or from the time the pilot actually reported for pilotage services, whichever is later, until the request is cancelled.

3) The total amount payable under subsections (1) and (2) shall not exceed $240 per twenty-four hour period.

4) Notwithstanding subsections (1) and (2), the pilotage charges prescribed by those subsections are not payable where, during the period from the 1st day of January to the 15th day of March in any year, the services of a licensed pilot are requested for a ship in District No. 1 and the request is thereafter cancelled for reasons of stress of weather or adverse ice conditions that occur after the pilot has been assigned to the ship and before an attempt is made to sail the ship.

Overcarriage of Pilots

13. 1) Subject to subsection (2), where a pilto is carried on a ship beyond the area for which he is licensed, a pilotage charge of $24 is payable for each hour or part thereof in excess of the first hour of overcarriage.

2) The total amount payable under subsection (1) shall not exceed $240 per twenty-four hour period.

Travelling and Other Expenses of Pilots

14. In addition to the pilotage charges set out in this Schedule, where a pilot is required to board or disembark from a ship at a place other than the established pilot boarding stations at Les Escoumins, Port Alfred, Chicoutimi, Quebec, Trois-Rivieres, Sorel, Lanoraie and Montreal, the travelling and other expenses incurred by the pilot that are directly associated with his assignment to pilot a ship are payable as a pilotage charge.

Pilot Boat Charges

15. 1) Where a pilot boat is used to embark or disembark a pilot at a pilot boarding station, a pilotage charge in an amount equal to the actual cost, not including any administrative expense incurred by the Authority in providing the boat, is payable each time the boat is so used.

2) Where a boat other than a pilot boat is hired for the purpose of embarking or disembarking a pilot at a pilot boarding station, a pilotage charge in an amount equal to the actual charge for the hire of the boat is payable.

3) Where a pilot is required to embark or disembark from a ship at a place other than an established pilot boarding station referred to in section 14, a pilotage charge in an amount equal to the fee for the hire of a boat to enable the pilot to board or disembark from the ship is payable.

Radio Telephone Charge

16. Where the use of portable radio telephone equipment is specifically requested by the owner, master or agent of a ship or such use is required by law, the following pilotage charges are payable.

a)	for a pilotage trip ------------------------- and	$ 67.00
b)	for a movage that is not part of a pilotage trip ---	28.00

Schedule

1.	Switching charges on	
	(a) all rolling stock not otherwise specified	
	(i) port cars, per car	$ 33.12
	(ii) industrial cars, per car...........	67.57
	(b) cars containing explosives, per car......	135.15
	(c) passenger cars, per car..................	109.97
	(d) dimensional load cars, per car...........	109.97
	(e) special equipment cars, per car..........	109.97
	(f) non-freight units, per car...............	109.97
2.	Weighing charges, car loaded or empty, weighed on track scale, per car...............	11.92
3.	Work outside regular hours and services not otherwise specified.......................	Cost plus 15%

OR CONTAINERS: SHIFT WORK

ASSIFICATION	NO. OF MEN	DETENTIONS & EXTRA LABOUR		OVERTIME DIFFERENTIAL					
				OVERTIME (1/2)		DOUBLE TIME		TRIPLE TIME	
		RATE	AMOUNT	RATE	AMOUNT	RATE	AMOUNT	RATE	AMOUNT
LONGSHOREMEN	6	27.34	164.04	9.96	59.76	19.92	119.52	39.85	239.10
CHECKERS	3	27.34	82.02	9.96	29.88	19.92	59.76	39.85	119.55
CRANE OPERATOR	2	27.34	54.68	9.96	19.92	19.92	39.84	39.85	79.70
LIFT OPERATORS	4	27.34	109.36	9.96	39.84	19.92	79.68	39.85	159.40
TUG OPERATORS	3	27.34	82.02	9.96	29.88	19.92	59.76	39.85	119.55
FOREMAN	1	28.22	28.22	10.32	10.32	20.63	20.63	41.26	41.26
WALKING BOSS	1	28.67	28.67	10.49	10.49	20.99	20.99	41.97	41.97
STOWAGEMAN (IMPORT)/ FLOORMAN (IMPORT)	1	28.67	28.67	10.49	10.49	20.99	20.99	41.97	41.97
PRINCIPAL GANG	21		577.68		210.58		421.17		842.50
LONGSHOREMEN	6	27.34	164.04	9.96	59.76	19.92	119.52	39.85	239.10
CHECKERS	3	27.34	82.02	9.96	29.88	19.92	59.76	39.85	119.55
CRANE OPERATORS	2	27.34	54.68	9.96	19.92	19.92	39.84	39.85	79.70
LIFT OPERATORS	4	27.34	109.36	9.96	39.84	19.92	79.68	39.85	159.40
TUG OPERATORS	3	27.34	82.02	9.96	29.88	19.92	59.76	39.85	119.55
FOREMAN	1	28.22	28.22	10.32	10.32	20.63	20.63	41.26	41.26
SUBSEQUENT GANG	19		520.34		189.60		379.19		758.56

APPENDIX E

Port Charges - Port of Felixstowe

SCHEDULE OF DUES

Harbour Dues
Felixstowe

Effective date: 1st January, 1984

Conservancy Dues and Surcharges, where applicable, are payable on entry to the Harbour by all vessels of 50 G.R.T. and above according to the following scales:

Conservancy Dues:	Levied upon all vessels
Surcharge 'A':	Levied upon all vessels berthing at the Walton, Landguard, Dooley and the Gas Jetty Terminals, Port of Felixstowe.
Surcharge 'B':	Levied upon all vessels exceeding 20,000 G.R.T.

	Conservancy Dues pence per GRT	Surcharge 'A' pence per GRT	Surcharge 'B' pence per GRT
Vessels not exceeding 5,000 G.R.T.	1.67	1.00*	
Vessels over 5,000 G.R.T. but not exceeding 10,000 G.R.T.	1.96	2.00*	
ssels over 10,000 G.R.T. but not exceeding 15,750 G.R.T.	3.63	3.00	
Vessels over 15,750 G.R.T. but not exceeding 20,000 G.R.T.	7.36	4.5	
Vessels over 20,000 G.R.T. but not exceeding 25,000 G.R.T.	7.36		6.00
Vessels exceeding 25,000 G.R.T.	7.36		7.00

* Not applicable to ships berthing at the Gas Jetty Terminal.

The above Dues apply to vessels whose stay within the Harbour does not exceed 30 days. The rate for vessels whose stay within the Harbour exceeds 30 days is 75% of the Conservancy Dues and Surcharge where applicable for each period of 30 days or part thereof in excess of the first 30 days.

Other Charges

The Board may demand, take and recover other Charges as provided in the Harwich Harbour Act 1974.

Pilotage Rates

Felixstowe

LONDON (SEA PILOTS NORTH)
THE SEA OR SUNK TO
HARWICH HARBOUR OR
VICE VERSA.
RATE 16 (BASIC + 3925%)
OPERATIVE DATE 1.3.84.

SURCHARGE 3925%

GROSS TONNAGE	TONNAGE RATE	HALF RATE	DRAUGHT	RATE	HALF RATE	MAXIMUM	HALF MAXIMUM
1,000	4.19	6.29	12.00	116.39	120.33	135.34	139.62
2,000	8.39	10.48	13.00	124.27	128.13	143.89	148.17
3,000	12.58	14.67	14.00	131.99	135.84	152.45	156.72
4,000	16.77	18.87	15.00	139.70	143.47	161.00	165.28
5,000	20.96	23.06	16.00	147.25	150.94	169.55	173.83
6,000	25.16	27.25	17.00	154.63	158.40	178.11	182.63
7,000	29.35	31.45	18.00	162.17	165.95	187.16	191.69
8,000	33.54	35.64	19.00	169.72	173.58	196.22	200.75
9,000	37.73	39.83	20.00	177.44	181.13	205.28	209.80
10,000	41.93	44.02	21.00	184.81	188.50	214.33	218.86
11,000	46.12	48.22	22.00	192.19	195.88	223.39	227.92
12,000	50.31	52.41	23.00	199.57	203.09	232.44	236.97
13,000	54.51	56.60	24.00	206.62	210.05	241.50	246.03
14,000	58.70	60.79	25.00	213.49	216.34	250.56	255.08
15,000	62.89	64.99	26.00	219.19	221.29	259.61	264.14
16,000	67.08	69.18	27.00	223.39	224.73	268.67	273.20
17,000	71.28	73.37	28.00	226.07	226.41	277.73	282.25
18,000	75.47	77.57	29.00	226.74	227.08	286.78	291.31
19,000	79.66	81.76	30.00	227.41	227.75	295.84	300.37
20,000	83.85	85.95	31.00	228.08	228.42	304.89	309.42
21,000	88.05	90.14	31.75	228.75	0.00	313.95	0.00
22,000	92.24	94.34	32.00	230.10	231.10	332.06	345.65
23,000	96.43	98.53	33.00	232.11	233.11	359.23	372.82
24,000	100.63	102.72	34.00	234.12	235.13	386.40	399.98
25,000	104.82	106.91	35.00	236.13	237.14	413.57	427.15
26,000	109.01	111.11	36.00	238.15	239.15	440.74	454.32
27,000	113.20	115.30	37.00	240.16	241.16	467.91	481.49
28,000	117.40	119.49	38.00	242.17	243.18	495.08	508.66
29,000	121.59	123.68	39.00	244.18	245.19	522.24	535.83
30,000	125.78	127.88	40.00	246.20	247.20	549.41	563.00
31,000	129.97	132.07	41.00	248.21	249.21	576.58	590.17
32,000	134.17	136.26	42.00	250.22	251.23	603.75	617.34
33,000	138.36	140.46	43.00	252.23	253.24	630.92	644.50
34,000	142.55	144.65	44.00	254.25	255.25	658.09	671.67
35,000	146.74	148.84	45.00	256.26	257.26	685.26	698.84
36,000	150.94	153.03	46.00	258.27	259.28	712.43	726.01
37,000	155.13	157.23	47.00	260.28	261.29	739.59	753.18
38,000	159.32	161.42	48.00	262.30	263.30	766.76	780.35
39,000	163.52	165.61	49.00	264.31	265.31	793.93	807.52
40.000	167.71	169.80	50.00	266.32	0.00	821.10	0.00

RATE 16.

Rates for Marine Services

A 24 hour radio watch is kept on VHF Channels 14 and 16. Contact with the Dock Tugs may be made [illegible] internal telephone number 269 or outside line Felixstowe 282497.

The following rates are applicable for assisting on and off the berth per tug:	Monday/Friday 08.00-17.00	At all other times excluding Public Holidays	Public Holidays
Vessels up to 31m. in length	£35.16	£51.84	£62.22
Vessels over 31m. and up to 61m. in length	£70.33	£103.69	[illegible]
Vessels over 61m. and up to 77m. in length	£105.52	£155.49	[illegible]
Vessels over 77m. and up to 92m. in length	£140.66	£207.30	£248.76
Vessels over 92m. in length (Dock Basin only)	£161.16	£229.11	£274.92
Vessels over 92m. and up to 107m. in length (in Tideways i.e. Container Terminals and Oil Jetty)	£180.22	£244.69	£305.53
Conveying passengers, transport and stores, equipment etc., in Harwich Harbour limits	£52.77	£69.11	£82.95
Per hour (minimum half an hour)	£35.15	£35.15	£41.42

Once an order for a Tug has been placed and it has been subsequently cancelled a 50% charge will be made. A charge of £10.00 will be made when ropes are supplied by the Tug.

Mooring boats are available for running wires and transport of stores and equipment at the following charges:	Monday/Friday 08.00-17.00	At all other times excluding Public Holidays	Public Holidays
Mooring vessels at Oil Jetty (per boat)	£135.42	£152.07	£182.45
Unmooring vessels at Oil Jetty (per boat)	£135.42	£152.07	£182.[illegible]
Mooring vessels at Container Terminals (per boat)	£96.74	£114.05	[illegible]
Conveying passengers, stores, equipment etc. in Harwich Harbour limits	£30.91	£38.00	
Per hour (minimum half hour)	£19.29	£19.29	£22.81
Running wires in Dock Basin (Contact as Dock Tug) Minimum one hour	£47.36	£60.82	£72.99

Once an order for a Mooring boat has been placed and is subsequently cancelled, a 50% charge will be made.

Rates provided on application (contact Dock Tugs)

	At all times
Vessels up to 61m. in length	£57.13
Vessels over 61m. and up to 92m. in length	£115.43
Vessels over 92m. and up to 150m. in length	£194.72
Vessels over 150m. and up to 200m. in length	£279.84
Vessels over 200m. and up to 240m. in length	£374.29
Vessels over 240m. in length	£466.40
Vessels up to 150m. in length	£194.72
Vessels over 150m. in length	£279.84

Drinking and boiler water available at all quays and piers on application to the Dock Master	Monday/Friday 08.00-17.00	At all other times excluding Public Holidays	Public Holidays
	£1.47 per tonne	£1.47 per tonne Plus labour surcharge of £4.43 per hour (min 4 hrs)	£1.47 per tonne Plus labour surcharge of £6.65 per hour (min 4hrs)

Fresh water is also available at anchor by M.T. Ganges, Sauria, Egerton, & Alfred. Rates on application from The Alexandra Towing Co. (Felixstowe) Ltd.

Ships - Docks Dues

1. Vessels entering or leaving Felixstowe Dock or berthing at or unberthing from piers, quays and wharves	Current rates per G.R.T.
(a) For every vessel other than vessels to which head (b) of this paragraph or paragraph 2 of this Schedule apply, coming from or going to any of the under-mentioned ports and places:	
Any foreign port except any port or place on the coast of Europe bounded on the north by the River Elbe and on the south by the port of Brest:	89p
Any port or place on the coast of Europe within the area bounded on the north by the River Elbe and on the south by the port of Brest:	56p
Any port or place in the United Kingdom other than a port or place in the River Orwell or the River Stour.	39p
Any port or place in the River Orwell or the River Stour	24p
(b) For every fishing vessel owned by a person at least 75% of whose income is derived from fishing:	17p
2. Any vessels to which head (a) or (b) of the last foregoing paragraph apply which remains in the Dock or at the piers, quays or wharves for a longer period than 7 days – for every day or part of a day	£0.04
3. Vessels bunkering at Oil Jetty:	
(a) Vessels loading or discharging at Felixstowe Dock:	
First 4 hours.	No charge
Per hour thereafter:	£0.02 per G.R.T.
(b) Vessels loading or discharging at ports in the Orwell/Stour Estuary	
First 4 hours	£0.007 per G.R.T. per hour (Minimum payment £0.02 per G.R.T.)
Per hour thereafter	£0.02 per G.R.T.
(c) Vessels from places other than Ports in the Orwell/Stour Estuary	
First 4 hours.	£0.008 per G.R.T. per hour (Minimum payment £0.0333 per G.R.T.)
Per hours thereafter	£0.02 per G.R.T.

Commercial Tug Rates

There are four locally based tugs plus one reserve tug available for towage. At 1.7.83 these tugs are as follows:-

M.T. Alfred	Bollard Pull 40 tons
M.T. Ganges	Bollard Pull 42 tons
M.T. Sauria	Bollard Pull 18 tons
M.T. Egerton	Bollard Pull 18 tons
In reserve M.T. Langton	Bollard Pull 18 tons

Not more than four tugs will be available at any one time. It will not be possible to allow customers to nominate tugs but where possible the M.T. ALFRED and M.T. GANGES will be supplied for the towage of ships in excess of 195 metres in length.

These rates are based on the following scale of charges per tug movement and include towage to and from the approach channel beyond Beach End, or to and from the Fairway to Berth.

Length of Vessel	**Per Tug Movement**
Between 166m – 183m	£594
Between 183m – 194m	£750
194m and above	£900
220m and above, and all ships over 35,000 GRT	£1000

These rates are based on the following scale of charges per tug movement and include towage to and from the approach channel beyond Beach End, or to and from the Fairway to Berth.

Per Tug Movement	£556.00

The total cost for the towage of ships to and from berths of Felixstowe Dock & Railway Company, Felixstowe Oil Jetty or Walton Container Terminal is as follows:-

Length of Vessel	**Total Cost**	**Number of Tugs**
144 – 166 metres	£2,225	Two

The rates for seeing vessels on and off buoys, wharves and jetties at Felixstowe, are based on the following scale of charges per tug:-

Length of Vessel	**Monday – Friday 8 a.m. – 5 p.m.**	**Monday – Friday 8 a.m. – 5 p.m.**	**5 p.m. Friday to 8 a.m. Monday & Public Holidays**
144m – 166m	£419	£550	£660
122m – 144m	£276	£365	£435
107m – 122m	£198	£262	£311

In the event of such vessel requiring assistance to and from beyond Beach End to the Platters a charge of £73 per tug will be added to the above rates.

Where a vessel shifts berth between arrival and departure the rate per tug used per movement as on (2) above will be used. For a second shift after arrival and before departure rates will be reduced by 50%.

Commercial Tug Rates

Length of Vessel	Between 166m and 183m	Between 183m and 194m	Between 194m and 220m	Over 35,000 GRT and/or over 220m
1st Tug	£300	£375	£450	£450
2nd Tug	£300	£375	£450	£450
3rd Tug	£300	£375	£450	£450
4th Tug	£600	£750	£900	£1,000

In the case of the first and second tugs on a towage this charge will be made once a tug has placed herself in a position to undertake towage and the order is subsequently cancelled.
Orders for the third and fourth tugs are required by 07.00 daily for the 24 hours from 8 a.m. that day to 8 a.m. the next day.
If the order is subsequently cancelled the above charges will be made.

Provision has been made so that a third and fourth tug can be made available at short notice for orders received between 08.00 and 20.00. Such requirements can be met for a premium payment of 33⅓% above published rates.

A 20% surcharge will apply for work carried out on Public Holidays.

Additional tugs can be supplied from Gravesend at 18 hours notice and the minimum rates for the supply of these tugs will be:-

	Per Tug Tide
8 a.m. Monday – 5 p.m. Friday	£1,224
5 p.m. Friday – 8 a.m. Monday	£1,463

A charge of £11.00 per tug is made when ropes are supplied by the tug.

Applicable to all towages

A 50% surcharge will be made for the towage of a ship with no power.

A period of three hours will be allowed from the time for which the tug is ordered until the time that the tug is dismissed. After three hours a charge of £60 per tug, per hour, or part of an hour, will be added to the cost.

The rates apply at any time of any day throughout the year except between 16.00 on December 24th and 09.00 on December 27th when a surcharge will be applied to cover extra wage costs.

Commercial Tug Rates

A 33⅓% Surcharge will be added when towage is undertaken and not booked in advance. To avoid this surcharge orders should be passed as follows:-

9 a.m. – 5 p.m. Monday to Friday – Two hours notice

5 p.m. Friday – 8 a.m. Monday – Before 3 p.m. Friday

5 p.m. – 8 a.m. Monday – Friday – Before 3 p.m. during office hours

Contract customers are required to settle accounts within 28 days of presentation to qualify for a five per cent reduction in rates.

All work undertaken by us is subject to the United Kingdom Standard Conditions for Towage and Other Services (Revised 1983).

Felixstowe Office
The Dock Office, Felixstowe Dock, Felixstowe, Suffolk IP11 8SR

Telephone Day
Felixstowe (0394) 284501/275321

Telephone (Nights and Weekends)

A.N. Tannock	Harwich (02555) 6800
R.F. Hazell	Woodbridge (03943) 3698
E. Nicholson	Woodbridge (03943) 3538

GRAY ECHO
WESER

DOCK COMPANY MOORING BOATS

Mooring boats are available for running wires and transport of stores and equipment at the following charges:

	Monday/ Friday 08.00-17.00	At all other times excluding Public Holidays	Public Holidays
Mooring Vessels at Oil Jetty (per boat)	*£135.42*	*£152.07*	*£182.45*
Unmooring Vessels at Oil Jetty (per boat)	*£135.42*	*£152.07*	*£182.45*
Mooring Vessels at Container Terminals and Dock Basis (per boat)	*£96.74*	*£114.05*	*£136.84*
Conveying passengers, stores, equipment, etc. in Harwich Harbour limits	*£30.91* per hour	*£38.00* per hour	*£45.60* per hour
Minimum half an hour	*£19.29*	*£19.29*	*£22.81*
Running wires in Dock Basin	*£47.36*	*£60.82*	*£72.99*
		Minimum one hour	

Once an order for a mooring boat has been placed and it has been subsequently cancelled, a 50% charge will be made.
(Contact as Dock Tugs)

DIVING SERVICES

Rates provided on application
(Contact as Dock Tugs)

MOORING CHARGES EXCLUDING OIL JETTY

	At all times	
Vessels up to 61m in length	*£57.13*	Mooring and Unmooring
Vessels over 61m. and up to 92m. in length	*£115.43*	Mooring and Unmooring
Vessels over 92m. and up to 150m. in length	*£194.72*	Mooring and Unmooring
Vessels over 150m. and up to 200m. in length	*£279.84*	Mooring and Unmooring
Vessels over 200m. and up to 240m. in length	*£374.29*	Mooring and Unmooring
Vessels over 240m. in length	*£466.40*	Mooring and Unmooring

MOORING CHARGES OIL JETTY

Vessels up to 150m. in length	*£194.72*	Mooring and Unmooring
Vessels over 150m. in length	*£279.84*	Mooring and Unmooring

FRESH WATER CHARGES

Drinking and boiler water available at all quays and piers on application to the Dock Master.

Monday/ Friday 08.00-17.00	At all other times excluding Public Holidays	Public Holidays
£1.47 per tonne	*£1.47* per tonne Plus labour surcharge of *£4.43* per hour (Minimum 4 hours)	*£1.47* per tonne Plus labour surcharge of *£6.65* per hour (Minimum 8 hours)

Fresh water is also available for ships at anchor by M.T. Ganges, Sauria, Egerton and Alfred. Rates on application from The Alexandra Towing Co. (Felixstowe) Limited.

STEVEDORING CHARGES, SHIPS' DUES AND RATES FOR MARINE SERVICES

GENERAL TRADING TERMS AND CONDITIONS

All goods are accepted by the Felixstowe Dock & Railway Company subject to the Trading Terms and Conditions on Pages 19 - 21.

VALUE ADDED TAX

Charges quoted in this Schedule do not include Value Added Tax. Where applicable this will be charged in addition and shown separately on the invoice.

HAZARDOUS OR DIRTY GOODS

All such goods (excluding explosives) will incur a surcharge.

PROVISION OF FORKLIFT IN SHIP'S HOLD

Provision of Forklift to work goods in ship's hold — ***£19.63*** per hour.

TRANSHIPMENT GOODS AND UNITISED GOODS

All such goods will incur Stevedoring Charges both inwards and outwards.

EXTRA LABOUR CHARGES

Adverse Weather Standby Charge

08.00 hours to 16.30 hours Monday to Thursday and 08.00 hours to 15.30 hours Friday	***£5.80*** per man per hour
After 16.30 hours Monday to 08.00 hours Friday and after 15.30 hours Friday to 16.00 hours Saturday	***£6.89*** per man per hour
After 16.00 hours Saturday to 08.00 hours Monday	***£8.48*** per man per hour

Lashing, Chocking and Dunnaging Cargo

08.00 hours to 16.30 hours Monday to Thursday and 08.00 hours to 15.30 hours Friday	***£13.52*** per man per hour
After 16.30 hours to 24.00 hours Monday to Thursday and Friday after 15.30 hours to 24.00 hours Friday	***£15.78*** per man per hour
00.00 hours to 08.00 hours Tuesday to Saturday and 08.00 hours Saturday to 08.00 hours Monday	***£18.08*** per man per hour (Minimum charge 4 hours Saturday 08.00 hours to 08.00 hours Monday Minimum charge 8 hours)

Standing by for Vessels or for Goods, attending Hatches and Beams and Rigging Ships Gear

(Excluding Container and Ro/Ro Vessels)

(See Pages 14 and 15 for these charges)

08.00 hours to 16.30 hours Monday to Thursday and 08.00 hours to 15.30 hours Friday	***£9.87*** per man per hour
After 16.30 hours Monday to 08.00 hours Friday and after 15.30 hours Friday to 16.00 hours Saturday	***£11.67*** per man per hour (Minimum charge 8 hours Saturday 08.00 hours to 16.00 hours)
After 16.00 hours Saturday to 08.00 hours Monday	***£14.52*** per man per hour (Minimum charge 8 hours)

LANDGUARD CONTAINER TERMINAL

ll charges are per tonne
nless otherwise stated

Additional charges when goods are discharged/loaded outside 08.00 hours to 08.00 hours Monday to Friday and Friday 08.00 hours to 15.00 hours, 16.00 hours to 23.00 hours and Saturday 00.00 hours to 07.00 hours.

GOODS	IMPORT	EXPORT	Friday 15.00 hours to 16.00 hours 23.00 hours to 24.00 hours Saturday from 07.00 hours to 08.00 hours	Saturday 08.00 hours to 16.00 hours	After 16.00 hours Saturday through to 08.00 hours Monday	The additional charges quoted will apply providing they meet the following minimum charges quoted below
.S.O. CONTAINERS, EMI-TRAILERS AND ACCOMPANIED 'RAILERS ION I.S.O. CONTAINERS LATFORMS AND FLATS	Rates on application	Rates on application	£126.00 per gang per hour	£126.00 per gang per hour Minimum charge 8 hours	£177.00 per gang per hour Minimum charge 8 hours	Customers requesting work outside normal working hours will be held responsible for any cancellation of work, and will be charged a minimum of 4 hours at the Standing by for vessel or for goods Charges quoted below.

DOOLEY CONTAINER TERMINAL, RO/RO TERMINALS & DOCK BASIN

ll charges are per tonne
nless otherwise stated

Additional charges when goods are discharged/loaded outside 08.00 hours to 24.00 hours Monday to Thursday and Friday from 08.00 hours to 15.00 hours and 16.00 hours to 23.00 hours on recognised Container and Roll-on/Roll-off vessels. Dock Basin overtime for Container vessels will be charged as per charges on Page 13. (Quotation subject to overtime minimum charge in last column.)

GOODS	IMPORT	EXPORT	Friday 15.00 hours to 16.00 hours 23.00 hours to 24.00 hours	Tuesday to Saturday 00.00 hours to 02.00 hours 06.00 hours to 08.00 hours	Saturday 08.00 hours to 16.00 hours	Tuesday to Saturday 02.00 hours to 06.00 hours and Saturday 16.00 hours to 08.00 hours Monday	The additional charges quoted will apply providing they meet the following minimum charges quoted below
.S.O. CONTAINERS, EMI-TRAILERS AND ACCOMPANIED RAILERS ION I.S.O. CONTAINERS LATFORMS AND FLATS	Rates on application	Rates on application	£150.00 per gang per hour	£150.00 per gang per hour Minimum charge 4 hours (Minimum charge 8 hours after 04.00 hours)	£150.00 per gang per hour Minimum charge 8 hours	£197.00 per gang per hour Minimum charge 4 hours Minimum charge 8 hours after 04.00 hours weekdays and Saturday 16.00 hours to 08.00 hours Monday.	Customers requesting work outside normal working hours will be held responsible for any cancellation of work, and will be charged a minimum of 4 hours at the Standing by for vessel or for goods Charges quoted below.

DVERSE WEATHER STANDBY CHARGE

8.00 hours to 08.00 hours Monday to Saturday.	£100.00 per gang per hour
t all other times except Public Holidays in respect f which any customer would reimburse the elixstowe Dock & Railway Co., for additional cost	£134.00 per gang per hour

STANDING BY FOR VESSEL OR FOR GOODS

08.00 hours to 08.00 hours Monday to Saturday.	£168.00 per gang per hour
At all other times except Public Holidays in respect of which any customer would reimburse the Felixstowe Dock & Railway Co., for additional cost	£223.00 per gang per hour

Volume

2

WORKING PAPER · DOCUMENT DE TRAVAIL

Canadian Transport Commission
Research Branch

Commission canadienne des transports
Direction de la recherche

North Atlantic Container Shipping Costs Study Phase II

WP 20-86-26

Canada

NORTH ATLANTIC CONTAINER SHIPPING COSTS STUDY

Phase II

Final Report

Prepared for

CANADIAN TRANSPORT COMMISSION

Research Branch

WP 20-86-26

February 1986

Philippe I. Georges & Associates
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Commission

FOREWORD

This report forms part of a two-phase study prepared for the Canadian Transport Commission by a marine consultant. The Research Branch engaged the services of Philippe I. Georges and Associates of Montreal to develop a detailed data base related to ocean and port costs for selected North Atlantic routes.

A micro computer program was written using the cost figures developed by the consultant. Working Paper WP 20-86-21 provides one example of the type of analysis that can be carried out by manipulating the cost data in this versatile "model".

Whenever possible, the Commission makes publicly available the results of its research and the present report is offered, in limited quantities, in line with this policy. The text of the study is a reproduction of the final report submitted by the consultant and the opinions expressed are those of the author and do not necessarily reflect the views of the Canadian Transport Commission.

R. W. Lake
Executive Director
Research Branch

December 1986

Canada

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February 28, 1986

Mr. R. Lake
Executive Director
Research
Canadian Transport Commission
Ottawa K1A 0N9

Dear Mr. Lake:

I have the pleasure in submitting the final report on the "North Atlantic Container Shipping Cost Study - Phase II".

The report documents in detail identifiable elements of port costs on additional ports, namely Halifax, Saint John N.B., New York, Baltimore, Hamburg, Antwerp and Le Havre.

In addition, the report update all elements of costs developed in Phase I of the study to 1985 levels, as well as developing capital and vessel operating costs, for a Non-Ice Strengthened 1800 T.E.U. container vessel.

Voyage costs were recalculated and resultant impact on container unit costs described where there itineraries were varied to allow the substitution of Montreal with Halifax and New York as the single North American discharge/load port. Voyage costs, together with the resultant unit costs per container were developed for a Modified North Atlantic Container Triangular service. The itinerary for such a service would be Halifax - New York - Baltimore - Halifax to Felixstowe - Hamburg - Antwerp - Felixstowe - Le Havre.

In order to complete the window on the industry, the cost of marketing and sales should be identified and described. Further, inland transportation costs, associated with the movement of containers from major pre-determined points in North America to the various ports described in this study should be identified, for comparative cost purposes, when evaluating the various port costs and shipping options.

We would suggest, in view of the increasing number of combination Container-Ro/Ro vessels utilized on the North Atlantic Container trade, that capital and operating costs of these vessels be identified and developed.

It may be of interest to identify and define the impact on the vessels' operating cost and voyage cost if the study vessel, operated under a Canadian flag, instead of a British one, as assumed in this study.

I would be pleased to assist in any of the above utilizing a similar approach and methodology as adopted in both Phase I and Phase II.

I thank you for providing me with the opportunity of working on this study and trust that this report will meet with your approval.

Yours truly,

Philippe I. Georges, F.B.I.M.

cc: Mr. Arvo Ray

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"NORTH ATLANTIC CONTAINER SHIPPING COST STUDY - PHASE II"

Chapter 1 - Background and Introduction

1.1 Background

The Canadian Transport Commission retained the Consultant to expand and develop further the "North Atlantic Container Shipping Cost Study" completed in January 1985, into a second phase.

The purpose of Phase II of this study is to develop and identify further cost data on additional ports, namely, Halifax, St.John N.B., New York, Baltimore, Hamburg, Antwerp and Le Havre. In addition, costs developed in Phase I of the study were updated to 1985 levels, the result of which allows the consultant to recalculate voyage costs and identify impact on container unit costs where itineraries are varied to allow the substitution of the North American load port as well as increasing the number of North American port calls to the itinerary to represent a triangular container service voyage.

1.2 Introduction

In developing and defining the various elements of costs for the additional ports, various assumptions had to be made. These assumptions reflect actual practice, experience and most pragmatic approach.

As this phase is an expansion of the original study, the basic assumptions, structure, designated vessel, cargo distribution and the factors affecting them, remain as described in Phase I, unless otherwise indicated.

1.3 Methodology

The methodology adopted in this phase is the same as indicated and described in Chapter 2 of Phase I.

This phase of the study is structured into three basic sections, namely:

Section I	Definition and development of port and container handling costs for the ports of Halifax N.S., St.John N.B., Baltimore, New York, Hamburg, Antwerp and Le Havre.
Section II	Updates and refines various elements in the "North Atlantic Shipping Cost Study" Phase I, where necessity dictates.
Section III	Describes and calculates the impact or effect of substituting the North American load port used in Phase I, i.e. Montreal, with one of the North American ports described in this phase of the Study on the following: Voyage cycles, capital costs, daily vessel cost, voyage cost calculation. Describes and calculates the impact of increasing the voyage itinerary with calls at: Halifax - New York - Baltimore - Halifax to Felixstowe - Hamburg - Antwerp - Felixstowe and Le Havre on the following: voyage cycles, port time, sea time, voyage cost calculation.

The data developed on all fixed and variable elements of container handling costs productivity levels, identification of principal elements of port expenses is on the basis described in Phase I.

Costs and expenses have been expressed on a comparative basis to the elements of expenses developed in Phase I except where otherwise indicated.

Data and relevant information on distance, routing, steaming times, time in port have been developed to reflect the changes in port calls and voyage itineraries.

All calculations for the various ports have been developed in the local currency and subsequently converted to U.S. dollars. The various elements of expenses and cost developed in this phase of the study are 1985 costs.

Section I

Port and Container Handling Expenses

This section of the study deals with the port and container handling expenses for the additional ports.

As explained in the Study, all expenses incurred at a port are segregated into two main elements: port expenses and cargo expenses. Port expenses are those costs incurred and levied on the ship for use of the port and its facilities and are expressed as a cost per ship's call.

Cargo expenses are all the various costs incurred associated with the handling of the cargo and is expressed as a cost per unit or ton handled.

All expenses have been calculated in the local currency.

Chapter 2 - Halifax

2.1 Halifax - Port Expenses

The total port expenses statement for the designated vessel are shown in Exhibit I on a cost per call basis.

The following are the assumptions and basis of our calculations for the various elements.

2.1.1 Pilotage

This is based at this port on the basic charge of $187.32 plus $1.32 per pilotage unit.

$$\text{Pilotage unit} = \frac{\text{Length x Breadth x Depth}}{283.17} = \frac{230 \times 31 \times 16}{283.17}$$

= 402.86 pilotage units @ $1.32 per unit = $531.79

+ basic charge of $187.32 = $719.11 for each leg.

Therefore, the vessel will incur $719.11 in and $719.11 out.

2.1.2 Tugs

This expense is assessed on the G.R.T. (Gross Registered Tonnage) of the vessel, number of tugs and the port area.

We have assumed the use of two tugs in and two tugs out with the container terminal being in Area 1.

Basic charge for Area 1 for vessels over 30,000 G.R.T. = $945 + $575 for additional tug = $1,520.00 for two tugs in or out.

There is an additional charge of $365.00 per tug per hour for standby and 12% premium for services performed on holidays.

2.1.2 Tugs (cont'd)

We had assumed additional charges of $300 per call to cover any premiums or delays.

Total cost for two tugs: $1,520 + 150 = $1,670 in and $1,670 out.

2.1.3 Handling Lines

The cost per operation for mooring or unmooring is $395.00 in straight time and $592.00 in overtime. We have assumed that one will be in straight time and the other in overtime - making a total charge per call of $987.00.

2.1.4 Harbour Dues

These are assessed on the Gross Registered Tonnage of the vessel. The tariff for non-Canadian vessels being 3.89¢ per G.R.T.:

G.R.T. 31,000 x 3.89¢ per ton = $1,205.90 per call.

2.1.5 Dockage Dues

This is levied on the time period that the vessel utilises the berth with the rate per G.R.T. applied on periods of 12 hours.

For the purposes of our calculation we have assumed a total period of 84 hours made up as follows:

1st	12 hours 3.22¢ per G.R.T. x 31,000 =	998.20
2nd	12 hours 3.22¢ per G.R.T. x 31,000 =	998.20
Subsequent	12 hours 1.94¢ per G.R.T. x 31,000 x 5 =	3,007.00
	Cost of 84 hour stay	$5,003.40

2.1.6 Shipping Federation

Assessed on liner vessels at 2¢ per G.R.T. or a maximum of $225.00 per call assessed 7 times per year. We have assumed the maximum rate for each call.

2.1.7 Agency Fees

We have assumed that the owners appoint an agent, and have used the Shipping Federation port tariff for cargoes exceeding 20,000 tons - $2,655.00 for discharging and $2,655 for loading less 25% resulting in a total cost of $3,983.00 per call for husbanding the vessel.

A liner consortium will generally have its own agency office at its principle ports. If it does not have its own office, it will appoint an agent to husband the vessel and to collect freight and book cargo and deal with documentation. The latter tasks are a function of selling and are based on the freight, generally 5% on outgoing bookings and 2-1/2% on import.

2.1.8 Other

We have estimated a total cost of $1,050 for Port Warden, Customs, collection of garbage, electricity, fresh water. Though these may vary from call to call or per item, the cost is not significant.

Exhibit I

Port Expenses - Halifax

Vessel: 31,000 G.R.T. (1,800 TEUs) Draft: 10.5 meters

Time in port: 84 hours

		Cost per call Can.$ *
Pilotage	In	720
	Out	720
Tugs	In	1,670
	Out	1,670
Handling Lines		987
Harbour Dues		1,206
Dockage		5,003
Shipping Federation Dues		225
Agency Fees		3,983
Other:		
Port Warden		
Customs		
Garbage collection		1,050
Electricity		
Fresh water		
		$17,234

* rounded to $1.00

2.2 Halifax - Container Handling Expenses

Cargo expenses are the most significant and costliest item in the operation of a container vessel. This operation is always carried out at a container terminal where adequate container stacking space exists, where there are at least two container cranes, transtainers, front end loaders, trailers and an experienced work force. In Halifax, there are two such terminals: Halterm Container Terminal and Fairview Cove Ceres Terminal.

Productivity of container handling impacts on both the cost and turnaround times of a vessel.

The principal elements of container handling costs are the container box rate, overtime differential, lost time and detention, extra labour charges, securing, wharfage and MEA assessments.

Total container handling expenses developed for this port is shown in Exhibit II and is calculated in Canadian dollars.

In calculating the cost of container handling expenses, the following assumptions have been made for the designated vessel.

Containers

We have assumed the vessel discharges 1,800 TEUs and loads 1,800; this, due to the designated vessels mix of boxes, equates to 1,350 boxes in and 1,350 boxes out, of which the eastbound includes 400 empty boxes.

The mix of different sizes of containers that makes up our box totals is: 840 x 20ft. containers, 430 x 40ft. containers, 20 x 40ft. reefer containers and 60 half height containers. The mix of boxes has been assumed to be the same in both directions for the designated vessel.

Productivity

Productivity at the Port of Halifax is said to be at between 20 to 25 boxes per hour. This rate of productivity depends on: the mix of boxes, whether vessel is loading or discharging, number of load ports and the stowage in the cells.

We have assumed an average productivity rate of 20 boxes per gang hour per crane. If productivity is bettered in the actual operation, overtime work would be reduced and would result in a reduction in cost if vessel is within her schedule period.

Time in Port

We have assumed a time in port of 84 hours - working round the clock at the assumed productivity rate, with a margin that covers for possible detentions or lost time.

The total cost of discharging and loading our designated vessel at Halifax is shown in Exhibit II.

2.2.1 Container Box Rate

Terminals charge for the handling of containers on a box rate basis. The box handled can be full or empty - 20 ft, half height or 40 ft. The negotiated rate remains the same.

Terminal operators are reticent in revealing the actual box rate charged. These rates depend on the frequency of a line's vessels at the terminal, the annual volume and the type or class of vessel.

The negotiated rate includes overhead and profit and covers straight time worked on week days with an overtime differential premium being charged for any overtime work incurred.

The box rate generally covers the handling of containers in or out of the terminal on or off the ship, on to or from a trailer or railcar.

We have estimated a box rate of $125.00. This figure is said to be a reasonable estimate for the port, assuming a large volume and frequent user.

A vessel will invariably work with two cranes and gangs.

Crane gang size is said to be approximately 38 men including the shore gang - when working two cranes, or an average gang size of 19 men.

The hourly charge out rate per man is $21.05.

The total cost for handling the cargo in straight time is:

In 1,350 boxes @ $125 = $168,750
Out 1,350 boxes @ $125 = $168,750

2.2.2 Overtime Differential Cost

On the basis of 2,700 boxes in and out and an average productivity of 20 boxes per gang hour, the total crane gang hours to work the ship is:

2,700 boxes ÷ productivity 20 = 135 crane gang hours

As a vessel will invariably work two cranes, this would require a total of 67.5 hours to handle all the containers, well within the 84 hours, allotted to the port call in the schedule.

As the vessel will rarely arrive for an 8 a.m. start, we have assumed a loss in straight time availability on the first day and estimated a total straight time availability of 22 hours or 44 crane gang hours.

Overtime hours is estimated to amount to 135 - 44 = 91 crane gang hours, of which
48 gang/hrs are estimated at time and a half
43 gang/hrs are estimated at double time.

Time and a half applies to week day work from 1800 - 2300 and 2400 - 0500, with double time applying between the following hours: 1200 - 1300, 1700 - 1800, 2300 - 2400 and 0500 - 0800.

2.2.2 Overtime Differential (cont'd)

The gang hour cost is estimated to be:

19 men @ $21.05 = $399.95 per gang hour

The overtime differential rate for time and a half is $199.98 and for double time, $399.95.

Overtime cost:

48 hrs @ $199.98 =	9,598.80
43 hrs @ $399.95 =	17,197.85
	$26,796.65

This cost for overtime differential includes loading and off loading rail cars.

2.2.3 Lost Time and Detention

This cost is incurred when gangs have been ordered and are unable to work due to weather delays, awaiting lashings to be removed, malfunction, etc., any delays not caused by the contractor. It has been estimated that approximately 7 gang hours of lost time will be incurred.

A premium of 22% is applied to the gang hour cost of $399.95 resulting in a cost per gang of $487.94.

Cost of detention or lost time = Gang hour cost $487.94 x 7 = $3,415.57.

2.2.4 Extra Labour

The negotiated container box rate covers the cost of two movements from rail or trailer to stack and from stack to ship and vice versa. If for any reason more than two lifts are required, then extra charges will be incurred at a premium of 22% on cost ($25.68 per man hour). We have estimated an extra labour cost of 40 man hours at time and a half, i.e. 40 x ($21.05 + 22%) @ 1-1/2 time = $1,540.86.

2.2.5 Securing

This charge is incurred by all vessels. We have estimated the use of 256 man hours to fulfill the functions of unlashing and lashing. As this task tends to be undertaken prior to the commencement of discharging and completion of loading, we have assumed all 256 man hours will be in overtime at time and a half.

Cost per man - securing cost
\$21.05 x 22% premium @ 1-1/2 times
\$38.52 per m/hr x 256 = \$9,861.50.

2.2.6 MEA Assessment

This charge is assessed on the cargo and paid to the Maritimes Employers Association (shore labour) to cover job security. The rate is set at \$1.51 per ton.

The Study estimated an average tonnage of 15 per aggregate box.

Eastbound: 950 boxes @ 15 tons @ \$1.51 =	\$21,517.50
Westbound: 1,350 boxes @ 15 tons @ \$1.51 =	30,577.50
Total MEA Assessment	\$52,095.00

2.2.7 Wharfage

This charge is assessed by the port on the container line on all the cargo going over the quay on a tonnage basis at the rate of \$2.25 per ton.

Earlier we indicated an average weight per box of 15 tons.

Eastbound: 950 boxes @ 15 tons @ \$2.25	\$32,062.50
Westbound: 1,350 boxes @ 15 tons @ \$2.25	45,562.50
Total Wharfage Charge	\$77,625.00

See note in section 8.5.2.8 of Study.

Exhibit II

Container Handling Expenses - Halifax, N.S.

Cargo Inward: 1,350 boxes — Outward: 950 boxes + 400 Empty

Total Inward & Outward: 2,700 boxes or 3,600 TEUs (incl. 536 TEU empty)

Total Time in Port: 84 hrs — Productivity: 20 boxes per g/hr.

		Handling Costs in $Can.*
Container Box Rate		
Inward	$168.750	337,500
Outward:	$168,750	
Overtime differential		26,797
Lost Time & Detention		3,416
Extra Labour		1,541
Securing		9,862
MEA Assessment		52,095
Wharfage		77,625
Total Container Handling Expenses		$ 508,836

Cost per box: $188 — Cost per TEU: $141

If costs of handling empty containers are allocated to full boxes or TEUs:

Adjusted cost per box: $221 — Adjusted Cost per TEU: $166

* All rounded to nearest dollar.

Chapter 3 - Saint-John, New Brunswick

3.1 Port Expenses

The port of Saint-John has one container terminal which is operated by Brunterm. This terminal has four container berths and three gantry container cranes and an annual throughput capacity in excess of 200,000 TEUs.

Although there is sufficient water depth alongside the berths to accommodate the largest present generation container vessel, the port and its approaches are tidal. Vessels such as our designated vessel are subject to tides and deadlines. Such vessels arriving or sailing have to do so 2 hours before or after high water. This can impact on the vessel's time in port, as missing these tidal deadlines can result in an eight hour delay awaiting the next tide.

The ship's time allotted to this port on the designated vessel's voyage schedule is 84 hours as with the other North American single load/discharge port, used in this study.

The total port expenses developed are shown in Exhibit III on a cost per call basis.

3.1.1 Pilotage

This consists of two charges, a basic fee of $191.00 and unit charge for a one way trip of $1.87 per pilotage unit.

$$\text{The pilotage unit} = \frac{\text{Length x Breadth x Depth in meters}}{283.17}$$

This results in: 402.87 pilotage units @ $1.87 = $753.36.

Total pilotage fees: $753.36 + Basic charge of $191.00 = $944.36, say $945 inward and $945 outward.

3.1.2 Tugs

The charges for tugs are based on the area in which the terminal is located and the G.R.T. (Gross Registered Tonnage) of the vessel.

We have assumed the use of two tugs inward and two tugs outward, with the terminal being located in Area I. This results in a cost per tug of $1,130 or $2,260 in and $2,260 out.

3.1.3 Handling Lines

This is charged for on a cost per operation, with different rates being applied Monday-Friday, Saturdays and holidays, plus a charge for boatmen. We have assumed a cost of $1,057 per call.

3.1.4 Harbour Dues

These are assessed on the vessel's G.R.T. with a rate of 3.89¢ per G.R.T. on any non-Canadian registered vessel in the coastal trade.

Total harbour dues: 31,000 tons @ 3.89¢ = $1,205.90.

3.1.5 Dockage Dues

This is levied on the vessel's G.R.T. and the time period that the vessel utilises the berth.

On the basis of our assumption that the vessel is in port for 84 hours, the dockage dues payable are:

1st 12 hrs @ 3.22¢ x 31,000 G.R.T. =	$ 998.20
2nd 12 hrs @ 3.22¢ x 31,000 G.R.T. =	$ 998.20
Subsequent periods 1.94¢ x 31,000 G.R.T. x 5 =	$3,007.00
Calculated cost for 84 hrs =	$5,003.40

3.1.6 Shipping Federation Dues

Levied on all vessels, we have used the maximum rate of $225.00 per call.

3.1.7 Agency Fees

Using the same assumptions as was made for Montreal and Halifax, the agency fee would total $3,953.00. However, this is a hypothetical figure as a carrier will pay a flat fee for husbanding the vessel, plus a percentage of the revenue for booking cargo and the collection of freight (generally 5% on export and 2-1/2% on import) and the general tasks connected with the functions of a liner agent.

3.1.8 Other

We have estimated a total cost of $1,050 to cover miscellaneous charges that may be incurred by the vessel for: port warden services, Customs, garbage collection, etc.

Exhibit III

Port Expenses - Saint-John, N.B.

Vessel: 31,000 G.R.T. (1,800 TEUs)   **Draft:** 10.5 meters

Time in Port: 84 hrs.

			Cost per Call in $ Can.*
Pilotage			
	In	945	1,890
	Out	945	
Tugs			
	In	2,260	4,520
	Out	2,260	
Handling Lines			1,057
Harbour Dues			1,206
Dockage Dues			5,003
Shipping Federation			225
Agency Fees			3,953
Other			1,050
Total Port Expenses per Call			$ 18,904

* Rounded to nearest dollar.

3.2 Container Handling Expenses

The number of containers for the port of Saint-John are as per designated vessel's container distribution per voyage, outlined in the study for the North American load port.

This port being the single North American discharge and load port, the vessel would discharge 1,350 full boxes or 1,800 TEUs and load 950 full boxes or 1,264 TEUs and 400 empty containers or 536 TEUs.

The estimated tonnage of the total cargo discharged and loaded is 34,500 tons.

Productivity levels of up to 24 boxes per gang hour are said to be obtained. However, as per calculations for other ports in the study, we have used a conservative productivity level of 20 boxes per gang hour. Further, as indicated elsewhere, tide delays can be a factor at this port which can sometimes be compensated for by higher productivity.

The schedule of the designated vessel allotted 84 hours of ship's time to this port. This adequately allows for a conservative productivity level plus delays due to lost time, weather, securing, etc. whilst at the same time provides a reasonable time in port for the acceptance of cargo.

The total container handling expenses developed for this port are shown in Exhibit IV and are calculated in Canadian dollars.

3.2.1 Container Box Rate

Containers at this port are handled on a negotiated rate per box, which will vary depending upon the volume and frequency as well as the tasks that will be covered by the flat box rate for straight time work.

Stevedoring gangs may consist of 20 men per gang when working two gangs and including shipliners.

Box rates will generally include:

Load/unload containers, full/empty 20 ft. or 40 ft.
Receiving and delivery
Load/discharge from ship to stack and from stack to rail car and vice versa.
An agreed period of free storage in and out.

The movement of containers from ship to rail cars is done by tractor trailers, at this terminal. The container box rate we have developed for this port is $125.00 per container for straight time work Monday to Friday 0800-1200 and 1300-1700. The total straight time cost of handling containers is:

Inward: 1,350 containers @ $125.00 =	$168,750
Outward: 1,350 containers @ $125.00 =	168,750
	$337,500

3.2.2 Overtime Differential

Any work undertaken outside the specified straight time periods is subject to an additional overtime differential charge per gang of $203.40 for time and half and $406.80 for double time.

It is estimated that the net gang hour requirement to discharge and load the ship is 135 gang hours. For the purpose of port comparison, we have used the same work periods as the other North American ports in this study, namely:

44 gang hours of straight time
48 hours of time and half
43 gang hours at double time.

Overtime differential cost:

48 g/hrs @ $203.40 =	$ 9,763.20
43 g/hrs @ $406.80 =	17,492.40
	$27,255.60

3.2.3 Lost Time

This cost is incurred when gangs are unable to work due to delays not caused by the contractors, i.e. weather, delays, awaiting lashings to be removed, ship malfunction.

We have estimated a total lost time of seven gang hours. The charge out rate is $406.80 for a twenty man gang plus 20% premium. This results in a lost time cost of $3,417.12.

3.2.4 Extra Labour

This expense is incurred for any additional lifts or tasks not covered by the agreed container box rate. This includes discharging damaged containers, shifting and grounding containers from bays and incurring additional moves.

For comparative purposes, we have estimated 40 man hours of extra labour at time and half. This would be made up of two 5-man gangs at the minimum call out period of 4 hours.

This results in a cost of:

40 m/hrs @ $24.41 (basic rate + 20%)	$ 976.40
40 m/hrs @ $12.20 differential	488.00
	$1,464.40.

3.2.5 Securing

This expense is incurred by all vessels for the purpose of unsecuring and securing containers, including the placing of cones and bridges. Securing gangs consist of 4 men plus a foreman, known as shipliners at this port. The charge out rate is cost plus 20%.

As with other ports, we have estimated a total of 256 man hours at time and half.

256 m/hrs @ $24.41 =	$6,248.96
256 m/hrs @ $12.20 =	3,123.20
	$9,372.16

3.2.6 MEA Assessments

This charge is assessed on all cargo and is paid to the Maritime Employers Association to cover job security and administration. The rate established for Saint-John is $1.51 per metric ton, for container cargo:

Eastbound: 14,250 tons @ $1.51 =	$21,517.50
Westbound: 20,250 tons @ $1.51 =	30,577.50
Total MEA assessment	$52,095.00

3.2.7 Wharfage

This charge is assessed by Canada Ports Corporation on all cargo throughput on a tonnage basis. The rate assessed is $2.25 per ton.

Inwards: 1,350 boxes @ 15 tons @ $2.25 =	45,563
Outwards: 950 boxes @ 15 bons @ $2.25 =	32,062
Total wharfage:	$77,625

This charge is generally collected from the shipper over and above the freight rate and paid out by the carrier to the port. See 8.5.2.5 or page 83 in the study.

Exhibit IV

Container Handling Expenses - Saint-John, N.B.

Cargo: Inward: 1,350 boxes | Outward: 950 boxes + 400 Empty

Total Inward & Outward: 2,700 boxes or 3,600 TEUs (incl. 536 TEU empty)

Total Time in Port: 84 hours | Productivity: 20 boxes per g/hr.

		Handling Costs in $Can.*
Container Box Rate		
Inward	$168.750	337,500
Outward:	$168,750	
Overtime Differential		27,256
Lost Time & Detention		3,417
Extra Labour		1,465
Securing		9,372
MEA Assessment		52,095
Wharfage		77,625
Total Container Handling Costs		$ 508,730

Cost per box: $188

Cost per TEU: $141

If costs of handling empty containers are allocated to full boxes or TEUs:

Adjusted cost per box: $221

Adjusted Cost per TEU: $166.

* Rounded to nearest dollar.

Chapter 4 - Port of New York & New Jersey

4.1 Port Expenses

The port of New York and New Jersey possesses larger container handling facilities and capacity than any other U.S. East coast port, having some 12 container terminals with 40 gantry container cranes.

The total port expenses developed are shown in Exhibit V on a cost-per-call basis. All calculations are expressed in US dollars.

4.1.1 Pilotage

Transit time from the pilot station to the terminal is approximately 2-3 hours depending upon which container terminal is used. Pilotage charges are assessed for vessels inbound or outbound by the Sandy Hook Pilots, to or from New York/New Jersey and are based on "Pilotage units":

$$\text{Where the "pilotage units"} = \frac{\text{Length x Breadth x Depth}}{10{,}000} \quad \text{(in feet)}$$

$$\text{Designated vessel pilotage units} = \frac{754.59' \times 101.71' \times 52.49'}{10{,}000}$$

= 402.85 units @ \$6.30 per unit = \$2,538.00

There is an additional charge of \$75 for the pilot boat plus supplemental charges for delays, cancellation, anchoring or other tasks. We have estimated a cost of \$2,800 for pilotage inward and \$2,800 outward.

4.1.2 Tugs

Rates are based on the N.R.T. of the vessel and the zone in which the container terminal is located. Generally, the tug pilot determines the number of tugs required for a particular ship, in which case the fee charged covers the number of tugs required. Unless the Master of the ship requires additional tugs, in which case

4.1.2 Tugs (cont'd)

additional charges will be incurred. On the assumption that the container terminal is located in Zone 11, and the N.R.T. of the vessel is 18,000 the basic cost for tugs would be $3,000. There is an additional charge of 25% for any weekend, holiday work. We have therefore estimated a total cost for tugs of $6,750.

4.1.3 Docking Pilot

The task of a docking pilot is undertaken either by the Interport Pilot Agency or by the Tug Master. The charge is $500 in and $500 out.

4.1.4 Mooring & Unmooring

The cost of this operation is estimated at $900 in and $900 out.

4.1.5 Dockage Dues

This charge is assessed by the Terminal Operator and is based on the G.R.T. of the vessel per 24 hour period at 10¢ per ton.

On the basis of an 84 hr. stay in port, together with the designated vessel's G.R.T. of 31,000, this results in dockage dues of $10,850.

4.1.6 Tonnage Tax

This is a Federal tax assessed on the vessel's N.R.T. at 6¢ per ton and is payable a maximum of six times per annum. The cost per call is $1,080.00.

4.1.7 Agency Fees

These are subject to negotiation between the shipowner and the agent together with the tasks that the owner requires from the agent.

4.1.7 Agency Fees (cont'd)

The fee for husbanding the vessel is estimated at $2,000 per call. Should the agent be required to book cargo or collect freight, his fees would be based on a percentage of the revenue, generally 2-1/2% of the freight on import and 5% on export. If the liner operator has no presence at the port and requires the agent to undertake the task of container equipment control, this operating function can be undertaken by the agent at a cost of $20-30 per box. This charge has not been taken into account in the study, this being a part of a liner office operating cost.

4.1.8 Other

We have estimated a cost of $1,200 to cover miscellaneous charges that will be incurred by the vessel at the port, i.e. Customs, Department of Agriculture fees, garbage collection, etc.

Exhibit V

Port Expenses - Port of New York

Vessel: 31,000 G.R.T. (1,800 TEUs)

Draft: 10.5 meters

Time In Port: 84 hours

		Cost per Call in US$
Pilotage		
In	$2,800	5,600
Out	$2,800	
Tugs		6,750
Docking Pilot		1,000
Mooring & Unmooring		1,800
Dockage Dues		10,850
Tonnage Tax		1,080
Agency Fees		2,000
Other		1,200
Total Expenses per Call		$ 30,280

4.2 Container Handling Expenses

The number of containers for the port of New York are as per designated vessel's container distribution per voyage. This port being the single North American discharge and load port, the vessel would discharge 1,350 full boxes or 1,800 TEUs and load 950 full or 1,264 TEUs and 400 empty containers of 2,700 boxes in and out.

The estimated tonnage of the total cargo discharged and loaded is 34,500 tons.

Productivity levels of up to 24 boxes per gang hour are said to be attained. However, it is felt that an average 20 boxes per hour is a reasonable level to fully discharge and load the vessel.

The schedule of the designated vessel allotted 84 hrs to the port. That adequately allows for a productivity level of 20 boxes per gang hour plus lost time securing and unsecuring.

Total container handling expenses developed for this port are shown in Exhibit VI and are calculated in US dollars.

4.2.1 Container Box Rate

Containers at this port are handled on a negotiated rate per box, which will vary from terminal to terminal depending on the tasks that will be covered by a flat box rate for straight time work.

Stevedoring gangs can consist of as many as 27 men per gang plus a shore gang of up to 23 men if two gangs are working the ship.

Box rates will generally include:

Load/unload containers empty full, 20 ft or 40 ft.
Receiving and delivery and wharfage
First day free storage inward and 10 days outward

4.2.1 Container Box Rate (cont'd)

From ship to trailer/chassis and vice versa
Wharfage

Container handling at New York tends to be a wheeled operation, i.e. trailer chassis. Box rates are therefore negotiated on that basis. If containers are to be grounded there is an additional charge. We have assumed an 80% wheeled operation and a 20% grounded. This results in a box rate of $172.00.

The total straight time cost of handling containers is:

Inward 1,350 @ $172 =	$232,200
Outward 1,350 @ $172 =	$232,200
	$464,400

4.2.2 Overtime Differential

Box rate covers straight time, working Monday-Friday, 0800-1200, and 1300-1700. Any work outside these hours will result in an overtime differential being charged for both shore and ship gangs. If ship works two gangs, the average differential cost per gang including shore labour is:

At time and half $925 per gang/hour
At double time $1,310 per gang/hour.

It is estimated that the net gang hour requirement to discharge and load the vessel will be 135 gang hours. For port comparative purposes, we have used the same work periods as the other North American ports in this study, namely:

44 gang hours of straight time
48 gang hours at time and half
43 gang hours at double time.

4.2.2 Overtime Differential (cont'd)

Overtime differential cost:

48 hrs @ $925 =	$ 44,400
43 hrs @ $1,310 =	$ 56,330
	$100,730

Overtime cost at New York tends to be higher than that incurred at Baltimore due to the size of the standing shore gang.

4.2.3 Lost Time

This cost is incurred when gangs have been ordered and are unable to work due to weather delays, awaiting lashings to be removed, malfunction or any delays not caused by the contractor. We have estimated seven gang hours of lost time. The straight time charge out rate is $772.00 per gang hour (excluding overhead & profit) covering 28 men excluding shore gang which are only charged out where overtime lost time is incurred, in which case the inclusive cost is $1,697 per gang hour.

Estimated lost time = 7 x $772 = $5,404.

4.2.4 Extra Labour

This expense is incurred for work undertaken by stevedores for tasks not covered by the agreed container box rate, e.g. discharging damaged containers, shifting, grounding or incurring additional moves. For comparative purposes, we have estimated 40 man hours of extra labour at time and half. This results in a cost of:

40 m/hrs @ $32.50 + $14.30 = $1,872.00

4.2.5 Securing

This expense is incurred by all vessels for the purpose of unsecuring and securing containers excluding the placing of cones and bridges. Securing gangs tend to consist of 6 men plus a foreman. As a major part of this work tends to be undertaken outside regular hours, we have estimated 256 man hours will be incurred at time and a half.

4.2.5 Securing (cont'd)

256/hr @ $32.50 =	8,320.00
256 m/hr @ $14.30 =	3,660.80
	$11,980.80

4.2.6 Royalties/Assessments

These consist of three separate charges that are incurred by all containers at the port. These are namely: New York ILA Assessment, Container Royalty, and Job Security and are levied as follows:

a) New York ILA Assessment: The rate is $5.85 per 2,240 lbs or 40 cu.ft., whichever is greatest. In addition, there is a charge of $65.00 per box on all containers destined within 260 miles of New York.

Further all empty containers are assessed a flat charge of $40 per box.

This results in the following cost:

Total tonnage: 34,500 @ $5.85 =	$201,825
Assuming 10% of boxes for N.Y. @ 230 @ $65.00 =	14,950
Empty Containers 400 @ $40 =	16,000
	$232,775

b) Container Royalty: This is assessed on all cargo throughput at the rate of $3.00 per weight ton:

34,500 tons @ $3.00: $103,500.

c) Job Security Program: This charge is assessed on all cargo at a rate of $1.00 per weight ton resulting in a total of $34,500.

Exhibit VI

Cargo Handling Costs - Port of New York

Cargo: Inward 1,350 boxes full Outward: 950 boxes + 400 empty

Total Inward & Outward: 2,700 boxes or 3,600 TEUs (536 TEU empty)

Total Time in Port: 84 hours Productivity: 20 boxes per g/h

		Handling Costs In US$*
Container Box Rate:		
Inward:	$232,200	464,400
Outward:	$232,200	
Overtime Differential		100,730
Lost Time		5,404
Extra Labour		1,872
Securing		11,981
Assessments:		
ILA New York:	$232,775	
Container Royalty:	$103,500	
Job Security:	$34,500	370,775
Total Cargo Expenses per Call		$ 955,162

Cost per box: $354 Cost per TEU: $265

Handling Cost where cost of handling empties allotted to full containers:

Adjusted Cost per Box: $415 Adjusted Cost per TEU: $312.

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* rounded to nearest $1.

Chapter 5 - Port of Baltimore

5.1 Port Expenses

The port of Baltimore is said to be the second leading container port along the US East and Gulf Coast. Container facilities include 13 container cranes and 11 berths. All cost calculations in this chapter are in US dollars.

The total port expenses developed are shown in Exhibit VII on a cost-per-call basis and are calculated in US dollars.

5.1.1 Pilotage

Transit time from the pilot station at Cape Henry is approximately 9 hrs (150 miles). Pilotage dues are based on the "pilotage unit" as determined by the following formula:

$$\frac{\text{Length Overall x Extreme Breadth x Depth to Uppermost Continuous Deck}}{10{,}000} \quad \text{(in feet)}$$

$$\text{Pilotage units of designated vessel: } \frac{754.6 \times 101.7 \times 52.5}{10{,}000} = 402.9$$

The tariff for vessels of 100 pilotage units and over is $7.05 per unit, with a maximum charge of $2,820 each way. In the case of our vessel, the maximum charge applies.

5.1.2 Tugs

Towage charges are based on the vessel's G.R.T. and the zone in which the terminal is situated. The estimated cost per tug is $900, including an allowance for overtime. As with other ports, the vessel will utilize two tugs in and two tugs outward. This results in a cost of $3,600.

5.1.3 Docking Pilot

This task is generally undertaken either by the tug Master or by a pilot from the Baltimore Docking Pilots Association. The cost is estimated at $180.00 in and $180.00 out.

5.1.4 Mooring and Unmooring

The estimated cost of mooring and unmooring is $380 in and $380 out.

5.1.5 Dockage/Berthing Dues

This charge is incurred for the privilege of berthing or making fast to the wharf and is assessed against the vessel on the basis of the N.R.T. (Net Registred Tonnage) for the period the vessel remains at the berth. Dockage is assessed on the basis of 25¢ per N.R.T. per 24 hr period or fraction thereof.

This results in a cost of: 18,000 x 25¢ x 3.5 days = $15,750

5.1.6 Tonnage Tax

This due is levied on a vessel and is assessed at 6¢ per N.R.T. or $1,080, paid a maximum of six times per annum.

5.1.7 Agency Fees

This estimated fee for husbanding a vessel is $2,000. A vessel engaged in a liner service will either have its own representative office or will engage an agent for selling, booking of cargo and collecting freight. The charge for this is subject to negotiations. However, it is generally based on 2% of the import freight and 5% of the export.

5.1.8 Other

It is estimated that $1,200 will be incurred in miscellaneous charges by the vessel at the port for Customs, Department of Agriculture inspection, garbage collection, etc.

Exhibit VII

Port Expenses - Port of Baltimore

Vessel: 31,000 G.R.T. (1,800 TEUs) Draft: 10.5 meters

Time in Port: 84 hours

		Cost per Call in US$
Pilotage:		
In:	$2,820	5,640
Out:	$2,820	
Tugs		3,600
Docking Pilot		360
Mooring & Unmooring		760
Dockage/Berthing Dues		15,750
US Tonnage Tax		1,080
Agency Fees		2,000
Other		1,200
Total Port Expenses per Call		$ 30,390

5.2 Container Handling Expenses

The volume of containers to be discharged and loaded for the Port of Baltimore are as per the designated vessels container distribution on the basis of a single North American port call per voyage. The vessel would discharge 1,350 full boxes or 1,800 TEUs and load 950 boxes or 1,264 TEUs plus 400 empty containers or a total of 2,700 boxes in and out.

The estimated tonnage is as per average tonnage calculated per box of 15 tons and amounts to a total of 34,500 tons.

Productivity levels of 23 boxes per gang hour are said to be achieved. However, it is felt that an average productivity level of 20 boxes per gang hour is more reasonable on the basis of discharging and loading a full cargo.

The schedule of the designated vessel allotted 84 hours of ship time to the port. That adequately allows for a productivity level of 20 boxes per gang hour and an allowance for delays and lost time and securing and unsecuring.

Total container handling expenses developed for this port are shown in Exhibit VIII and are calculated in US dollars.

5.2.1 Container Box Rate

Containers at this port are handled on a negotiated rate per box. Different rates for full and empty containers can be negotiated to cover specific aspects of the handling operation to be provided by the stevedore. For example, in Baltimore, the basic box rate that is sometimes quoted excludes receiving and delivery, mounting and grounding, weighing of export containers, storage fees, etc.

Average gang size at this port when working 2 gangs is 31 men per gang. For the purpose of our calculation, we have developed a container box rate which takes into account the following:

Load discharge, full or empty, 20 ft or 40 ft containers
Receiving and delivery in & out of terminal
Seven days free storage
Weighing of export containers
Cost of gantry cranes
Securing & unsecuring of containers

This results in an average box rate of $143.00 on all containers handled in straight time. This assumes an 80% wheeled operation at the terminal. The practice at this port tends to be wheeled operation, i.e. all containers loaded or discharged on to trailers or chassis.

Total straight time cost of handling containers is:

Inward 1,350 boxes @ $143 =	193,050
Outward 1,350 boxes @ $143 =	193,050
	$386,100

5.2.2 Overtime Differential

The container box rate only covers work from Monday to Friday, 0800-1200 and 1300-1700. Any work outside these hours is subject to an overtime differential.

The overtime differential charge out rate consists of the additional cost over straight time that will be incurred. Fringe benefits, overhead and profit are generally covered in the negotiated box rate.

Average man hour rates are said to be $33.12 per hour (including $11.16 of fringe benefits). The overtime differential rate for an average gang of 31men is $340.32 per gang hour, at time and a half, and $680.64 for double time.

For comparative purposes, we have used the same work periods and assumptions as with the other North American ports in the study, namely:

44 gang hours of straight time
48 gang hours at time and a half
43 gang hours at double time.

5.2.2 Overtime Differential (cont'd)

Overtime differential cost:

48 hrs @ $340.32 =	16,335.36
43 hrs @ $680.64 =	29,267.52
	$45,602.88

5.2.3 Lost Time

This cost is incurred when gangs are unable to work due to no fault of the contractor. We have estimated a total of seven gang hours of lost time.

The charge out rate is $1,027 per gang hour + cost of crane at $475.00 per hour or $1,502 @ 7 hrs = $10,514.

5.24 Extra Labour

This expense is to cover the estimated cost of additional tasks undertaken by the stevedores and not covered by the box rate.

We have estimated 40 man hours at time and a half. This results in a cost of:

40 m/hrs @ $33.12 =	1,324.80
40 m/hrs @ $10.98 =	439.20
	$1,764.00

5.2.5 Securing

Using the same assumptions as per the other North American ports in this study, we have estimated 256 man hours at time and a half. However, at Baltimore, the straight time cost of this operation is included in the container box rate. Therefore, only the overtime differential rate is applicable. The estimated charge out rate per man hour is half the basic man hour rate after deduction of fringe benefits.

This results in a cost of: 256 hrs @ $10.98 = $2,810.88

5.2.6 Assessments

There are two assessments levied on containers at this port: Container Royalty, which is paid to the I.L.A., and amounts to \$3.00 per weight ton, and Job Security which is assessed at \$1.00 per ton on all throughput cargo.

This results in a cost of:

Container Royalty: 34,500 tons @ \$3.00 =	103,500
Job Security: 34,500 tons @ \$1.00 =	34,500
	\$138,000

5.2.7 Wharfage

This charge is for use of the berth and is assessed by the Port of Baltimore Administration on all containers handled over the wharf. The tariff is \$1.00 per ton plus \$1.85 per ton on empty containers, where 20 ft. containers are considered to be 2 tons and 40 ft., 4 tons.

Total wharfage cost:

2,300 boxes @ 15 tons = 34,500 @ \$1.00 =	\$ 34,500
400 boxes or 536 TEUs @ \$3.70 per TEU =	1,983
	\$ 36,483

Exhibit VIII

Container Handling Cost - Port of Baltimore

Cargo Inward: 1,350 boxes

Outward: 950 boxes + 400 Empty

Total Inward & Outward: 2,700 boxes or 3,600 TEUs (incl. 536 Empty)

Total Time in Port: 84 hrs

Productivity: 20 boxes per g/hr.

		Handling Cost In US$*
Container Box Rate:		
Inward:	$193,050	386,100
Outward	$193,050	
Overtime Differential		45,603
Lost Time		10,514
Extra Labour		1,764
Securing		2,811
Container Assessments		138,000
Wharfage		36,483
Total Container Handling Expenses per Call		$ 621,275

Cost per box handled: $230

Cost per TEU handled: $173

Handling cost where the cost of handling empty containers is allocated to full boxes or TEUs:

Adjusted cost per box: $270

Adjusted cost per TEU: $203

* Rounded to $1.

Chapter 6 - Port of Hamburg

6.1 Port Expenses

Hamburg is one of Europe's most important container ports concentrating most of its container handling berths in a special container centre encompassing several berths for large vessels with some 28 container gantry cranes. The port handled over 1 million TEUs in 1984.

The port is situated on the River Elbe some 76 miles from the Elbe Light vessel. This requires a transit time of 7-8 hours.

The total port expenses developed are shown in Exhibit IX on a cost-per-call basis. All calculations are expressed in Deutsche marks.

6.1.1 Pilotage

At this port, this consists of two charges: pilotage royalty and pilotage tax (or dues).

a) Pilotage Royalty: This charge is based on the G.R.T. of the vessel and the number of pilotage districts the vessel will require to transit for the passage from the Elbe vessel to the Port of Hamburg. The charge, based on the existing tariff for the designated vessel's tonnage 31,000 G.R.T., amounts to D.M. 3,084.

b) Pilotage Tax: This charge is based upon the G.R.T. of the vessel and the number of pilotage districts. For the purpose of our calculation, this consists of two pilotage districts, Elbe Light Vessel to Brunsbuttel and Brunsbuttel to Hamburg, the tariff based on the tonnage of the designated vessel of 31,000 G.R.T. results in a cost of 3,874 D.M.

There are additional charges for VHF rental of 80 D.M. and other supplements for delays, additional tasks, etc.

We have estimated a rounded cost of 7,000 D.M. in and 7,000 D.M. out. This allows for miscellaneous charges.

6.1.2 Harbour Pilotage

This charge is based on the G.R.T. of the vessel and estimated at 900 D.M. in and 900 D.M. out.

6.1.3 Tugs

Charges for the use of tugs are based on the G.R.T. of the vessel, and the number of tugs required. There are also charges for supplements, delays, etc. We have assumed the use of two tugs in and two tugs out and developed a cost of 4,200 D.M. per tug or 8,400 D.M. in and 8,400 D.M. out.

6.1.4 Harbour Dues

These are based upon the vessel's G.R.T. and the route vessel is engaged in. We have used the tariff for a vessel in the liner track together with the designated vessel's G.R.T. This results in a cost for dues of 9,100 D.M.

6.1.5 Mooring and Unmooring

This charge is assessed on the vessel's G.R.T. and covers 24 hour service, Sundays and holidays included. We have developed a rate of 1,700 D.M. in and 1,700 D.M. out.

6.1.6 Shipreporting Service

This charge is incurred for reporting vessels passage along the river to the agent in Hamburg, from various reporting stations as well as forwarding of orders to the vessel on the river. We have estimated a cost of 200 D.M.

6.1.7 Agency Fees

These are generally subject to negotiations between the carrier and the agent and the tasks the agent will undertake on behalf of the carrier. There is a published tariff based on the vessel's G.R.T. and adjusted according to tasks that agent is to perform. We have estimated a flat rate of 9,000 D.M. for husbanding the vessel.

6.1.7 Agency Fees (cont'd)

If agent undertakes cargo bookings and freight collection as is previously explained, his fee is based on the revenue and is generally 5% on exports and 2% on imports.

6.1.8 Other

We have estimated a charge of 1,500 D.M. to cover miscellaneous charges, i.e. Seaman's Mission dues, lifeboat services, Customs, communication, garbage collection, and other incidental expenses incurred by the ship at the Port of Hamburg.

Exhibit IX

Port Expenses - Port of Hamburg

Vessel: 31,000 G.R.T. (1,800 TEUs)

Draft: 10.5 meters

Time in Port: 18 hours

		Expenses Per Call D.M.
Pilotage		
In	DM 7,000	
Out:	DM 7,000	14,000
Habour Pilotage		
In:	DM 900	
Out:	DM 900	1,800
Tugs		
In:	DM 8,400	
Out:	DM 8,400	16,800
Habour Dues		9,100
Mooring & Unmooring		3,400
Ship Reporting Service		200
Agency Fees		9,000
Other		1,500
Total Port Expenses per Call		55,800

6.2 Container Handling Expenses

The number of containers for Hamburg are as per designated vessel's container distribution per voyage. This amounts to 200 boxes inward (including 50 empty boxes) and 200 boxes outward, or a total of 535 TEUs in and out.

The estimated tonnage of cargo discharged and loaded is 5,280 tons. Ships time allotted to the port is 18 hours.

Productivity levels of up to 25 boxes per gang hour can be believed at this port. However, this depends on various factors, as vessel is only discharging and loading a part of cargo. The productivity level actually achieved would depend on the stowage mix of boxes, number of holds boxes are distributed in, etc. For the purpose of our calculations we have used an average productivity level of 20 boxes per gang hour.

Total container handling expenses developed for this port is shown in Exhibit X and is calculated in Deutsche Marks.

6.2.1 Container Box Rate

Container box rates vary and are subject to negotiations. The negotiated rate depends upon frequency, class of vessel, annual container volume and if separate rates are required for full boxes and empties. The negotiated box rate at this port covers the following operation:

Load/discharge full or empty boxes any size
Lashing and unlashing
Small periods of lost time
A work period covering 3 shifts, Monday to Friday 0700-1500, 1500-2300 and 2300-0700
Overtime supplements are payable for weekend work

6.2.1 Container Box Rate (cont'd)

We have developed an average box rate of 210 DM for a frequent user. Container box rate cost:

400 boxes at 210 DM = 84,000 DM.

6.2.2 Receiving & Delivery

This aspect of the operation is not included in the box rate and covers the cost of a gate charge for receiving and delivering containers in the terminal and includes checking and documentation. The charge for this is estimated to be 70 DM per box for all boxes, full or empty. This results in a total cost of 28,000 DM.

6.2.3 Overtime Supplements

With a productivity level of 20 boxes per gang hour, a total of 20 gang hours will be required to work the vessel. Working two gangs, all the containers can be handled within the port time allotted in the schedule and within the 3 shift system covered in the box rate.

Should the vessel arrive or work during a weekend, an overtime supplement is payable for a minimum of 2 shifts and the cost for this is 2,800 DM per gang.

For contingency purposes, we have allowed one overtime supplement payment for one gang covering the minimum 2 shifts.

6.2.4 Lost Time

This expense is incurred when the stevedore gangs are unable to work due to delays caused by the ship or weather.

We have assumed two gang hours of lost time at a cost of 500 DM per hour amounting to 1,000 DM.

6.2.5 Extra Labour

This expense is incurred for additional container handling or for tasks not covered by the box rate, such as removing damaged containers, re-stowing and shifting containers from ship bays and landing them. When discharging or loading part cargoes such additional tasks tend to be incurred. We have allowed 2 gang hours at a cost of 500 DM per gang hour, resulting in a cost for extra labour of 1,000 DM.

6.2.6 Berth/Tonnage Dues

Tonnage dues are based on the vessel's net cubic capacity per 24 hour period berthing time or fraction thereof at the rate of 0.32 DM per net cbm. On the basis of 51,000 cu. meters, the tonnage dues for 18 hours would amount to 12,240 DM.

Exhibit X

Container Handling Expenses - Hamburg

Cargo: In 150 boxes full + 50 empty　　Out: 200 boxes full

Total: Inward & Outward 400 Boxes or 530 TEUs

Total Time in Port: 18 hours　　Productivity: 20 boxes/gang/hr

		Handling Cost D.M.*
Container Box Rate		
Inward	200 @ 210 DM = 42,000	84,000
Outward:	200 @ 210 DM = 42,000	
Receiving & Delivery		28,000
Overtime Supplement		2,800
Lost Time		1,000
Extra Labour		1,000
Tonnage Dues		12,240
Total Cargo Expenses		129,040

Cost per box handled: D.M.323　　Cost per TEU: D.M.243

Costs with empty containers handling charges, allocated to full boxes or TEUs:

Adjusted cost per box: D.M.369　　Adjusted Cost per TEU (464): D.M.278

* Rounded to nearest Mark

Chapter 7 - Port of Antwerp

7.1 Port Expenses

Antwerp is one of Europe's largest container handling ports, having several container terminals handling some million containers per annum. These terminals are situated in the port which is reached after a river transit and through a lock system requiring a transit time of approximately 8 hours from Flushing to the berth.

The total port expenses developed are shown in Exhibit XI on a cost-per-call basis.

7.1.1 Pilotage

Pilotage to the port consists of two charges: one for sea pilotage and the other for Scheldt River pilotage. The tariff is assessed on the ship's draft together with the distance zone along the River Scheldt to where the terminal is situated.

The pilotage charges are as follows:

Sea pilotage based on a draft of 105 m.	92,310	BF
River pilotage on 105 m draft to Zone 8	46,150	BF
Pilotage cost each way	138,460	BF

7.1.2 Tugs

Tugs are required for towage in both the river and in the dock basin to the berth.

Charges for river towage are based on the vessel's length, area zone in which the lock is located along the River Scheldt. For purposes of our calculation, we have assumed the lock as being in Area II; this together with the designated vessel's length of 230 meters, results in a cost per tug of 27,800 BF.

As we have allowed for the use of two tugs in and two tugs out, this results in a total cost of 111,200 BF for River towage. Dock towage charges are based upon the class of tug required, the G.R.T. of the vessel and the zone in which the berth is located within the port area.

7.1.2 Tugs (cont'd)

For the purpose of our calculations, we have assessed the berth as being in Area 8, requiring two Class "D" tugs. That, together with the designated vessel's G.R.T. of 31,000 tons, results in a dock towage charge of 63,880 BF per tug, or 127,760 BF in and 127,760 BF out.

7.1.3 Port or Harbour Dues

These dues are assessed on the vessel's G.R.T., the type vessel and the frequency of the vessel's use of the port.

The standard rate is 17.25 BF per G.R.T. This basic rate is subject to a reduction if the vessel is a container ship having a port frequency of at least every 30 days. For vessels with a G.R.T. of over 29,000 but less than 37,000, a reduction of 5 BF per G.R.T. is granted.

This results in tonnage dues of 31,000 x 12.25 BF = 379,750 BF.

7.1.4 Docking Pilot, Mooring and Unmooring

The charges for docking pilot are based upon the length of the vessel and the location of the berth from the lock entrance.

We have assumed the berth as being located in Area II. That, together with the vessel's length of 230 meters, results in a cost of 45,824 BF each way.

Mooring and unmooring charges are based upon the same components, resulting in a cost of 21,366 for mooring and 11,936 for unmooring or 33,302 BF per port call.

7.1.5 Wheelman

This expense is incurred for the use of a wheelman whilst the vessel is in transit in the River. That is, from the Scheldt Estuary to Antwerp Roads and the tariff is based on the vessel's length. This results in an expense of 15,630 BF each way or a total of 31,260 BF.

7.1.6 Police Dues

This charge is assessed on the G.R.T. of the vessel. For vessels in excess of 15,000 G.R.T., the dues are 9,100 BF per call.

7.1.7 Ships Reporting Service

This charge is assessed on the vessel's G.R.T. and the number of reporting points to and from the pilot station to the berth.

We have estimated a cost of 8,000 BF.

7.1.8 Agency Fees

The tariff scale for agency fees for husbanding the vessel at the port is based upon the G.R.T. and amounts to 149,000 BF for the designated vessel. Cargo bookings and freight collections are charged for separately and are generally based on a percentage of the revenue, i.e. 2-1/2% on import and 5% on export.

7.1.9 Other

We have estimated a charge of 15,000 BF to cover miscellaneous expenses that may be incurred during the ship's stay in port.

Exhibit XI

Port Expenses - Port of Antwerp

Vessel: 31,000 G.R.T. (1,800 TEU) Draft: 10.5 meters

Time in Port: 30 hours

	Cost per Call B.F.*
Pilotage In & Out	
Sea Pilotage: 92,310 In & 92,310 out River Pilotage: 46,150 in & 46,150 out	276,920
Tugs	
River towage: 111,200 Dock towage: 255,520	366,720
Harbour or dock dues	379,750
Docking Pilot & Boatmen	91,648
Mooring & Unmooring	33,302
Wheelman	31,260
Police Dues	9,100
Ship Reporting Service	8,000
Agency Fees	149,000
Other: Miscellaneous	15,000
Total Port Expenses Per Call	1,360,700

* nearest Franc.

7.2 Container Handling Expenses

The cargo for this port as per the designated vessel's cargo distribution for a voyage is 300 boxes in (including 100 empty) and 400 boxes out or 400 TEUs in and 535 TEUs out.

The estimated tonnage of the cargo discharged and loaded is estimated to total 9,000 tons.

Ship time allotted to this port, in the designated vessel's schedule, is 30 hours.

Productivity levels of between 175 to 200 boxes per 8-hour shift per gang are said to be attained at the port. However, as vessel is only discharging and loading a part cargo, productivity levels very much depend upon the stowage mix of boxes and number of hatches the cargo for that port is loaded in. We have used a conservative productivity of 20 boxes per gang hour.

Total container handling expenses developed for this port are shown in Exhibit XII and are calculated in Belgian Francs.

7.2.1 Container Box Rate

Container box rates vary between terminals and are subject to volume, frequency and negotiations.

The negotiated box rate at this port generally covers the following operations:

Load, unload full, empty, 20 ft and 40 ft boxes
Receiving and delivery of containers in the terminal
Documentation and checking
Lashing and unlashing
Handling containers from ship to stack and from stack to truck or railcar and vice versa
Ten days free storage on full containers
A work period covering two shifts (8 hrs), Monday to Friday from 0600-2200.

7.2.1 Container Box Rate (cont'd)

We have developed a rate for the above operation of 3,200 BF per box as a frequent user rate. This results in a cost for handling containers within the straight time periods of:

700 boxes @ 3,200 BF = 2,240,000 BF

7.2.2 Overtime Differential

With a productivity of 20 boxes per gang hour, a total of 35 gang/hours will be required to discharge and load. If the vessel works two gangs, the cargo can be handled within the time allotted to the port in the schedule. Whether all the work could be undertaken during the straight time periods would depend on her arrival time. In order to cover contingencies, we have allowed for one night shift gang on overtime. The overtime supplement per shift per gang for night work on week nights is 46,000 BF and 52,000 BF for Saturday work.

We have allowed an expense of 46,000 BF.

7.2.3 Lost Time

This expense is incurred when the stevedore gangs are unable to work due to delays caused by the vessel or weather. The cost per gang for lost time is 23,100 BF per gang hour.

We have allowed 4 gang hours of lost time, or 92,400 BF.

7.2.4 Extra Labour

This expense is incurred for additional handling on tasks not included in the box rate, such as removing damaged containers, re-stowing, shifting boxes from bays and landing them. As the vessel is discharging and loading a part cargo, such additional tasks will tend to be incurred.

We have allowed 4 gang hours of extra labour at a cost of 23,100 BF per gang hour or a total of 92,400 BF.

7.2.5 Cargo or Tonnage Dues

This is assessed on the cargo discharged and loaded at the port on a weight basis. The tariff rate is 2.85 BF per ton. Total dues amount to 25,650 BF.

Exhibit XII

Container Handling Expenses - Antwerp

Cargo: In 200 Boxes full + 100 Empty — Out: 400 boxes full

Total in & out: 700 boxes or 935 TEUs (802 TEU's full)

Time in Port: 30 hrs. — Productivity: 20 boxes per gang/hour

		Handling Costs Belgian Francs*
Container Box Rate		
In	300 @ 3,200 BF	2,240,000
Out	400 @ 3,200 BF	
Overtime Differential		46,000
Lost Time		92,400
Extra Labour		92,400
Cargo/Tonnage Dues		25,650
Total Cargo Expenses		2,496,450

Cost per box: 3,566 BF — Cost per TEU 2,670 BF

Costs with empty container handling charges allocated to full boxes only:

Adjusted Cost per box: 4,161 BF — Adjusted Cost per TEU: 3,113 BF

* Nearest franc

Chapter 8 - Port of Le Havre

8.1 Port Expenses

The port of Le Havre is France's largest container port, having three large container terminals, namely: Terminal de l'Atlantique, Terminal de l'Europe and Terminal de l'Océan. These terminals offer jointly some 3,700 meters of berthing space fitted with 13 gantry container cranes.

The total port expenses developed are shown in Exhibit XIII on a cost-per-call basis. All calculations are expressed in French Francs.

8.1.1 Pilotage

Pilotage charges are assessed on the cubic volume of the ship according to the vessel's physical characteristics by the following formula:

$$V = L \times I \times TE$$

in which "V" is expressed in cubic meters, L, I and TE representing respectively, the overall length of the ship, its maximum draft as per formula and maximum width, expressed in meters and decimeters.

The maximum draft of the ship to be used in the application of the above formula will be the theoretical value equal to $.14 \times \sqrt{L \times I}$. When calculated for the designated vessel, this results in a maximum draft of 11.82 meters. On the basis of the above formula for the designated vessel, her cubic volume is 84,276.6 m^3. The applicable tariff is as follows:

> 80,000 - 200,000 m^3 8,184 FF + .7773 FF for every additional 10 m^3 in excess of 80,000 m^3.

This results in the following expense (rounded):

Pilotage in: 8520 FF Out: 8520 FF.

8.1.2 Tugs

This expense is assessed on the length of the vessel provided that its maximum width and draft do not exceed the limits prescribed. The basic cost per tug for a 230 meter vessel is 9867 FF plus any supplements. We have assumed the use of two tugs in and two tugs out, and have estimated a total cost of 20,000 FF in and 20,000 FF out.

8.1.3 Mooring & Unmooring

This is assessed on the cubic volume of ship as per 8.1.1 with an allotted maximum time period of 2 hrs for each task. We have calculated a charge of 1500 FF in and 1500 FF out.

8.1.4 Port Dues

This charge is assessed on the vessel's cubic volume as calculated in 8.1.1 (amounting to 84,276.6 m^3) together with the port zone and class of vessel. Dues are assessed both inward and outward. The tariff for the designated vessel inwards is 1.44 FF and 0.95 FF outwards. These rates are subject to various reductions, namely: the ratio of container carrier capacity to the tonnage loaded and discharged, and the number of calls the carrier makes at the port of Le Havre.

We have calculated a rate of: 2.39 FF x .54 (after reduction for frequency) x .65 (after reduction of cargo ratio) x 84,276.6 m^3 = 70,700 FF (rounded) per call.

8.1.5 Agency Fees

We have assumed a flat fee of 4000 FF for husbanding the vessel, freight commissions on cargo bookings and collections generally 2.5 % on import and 5 % on export.

8.1.6 Other

Miscellaneous charges incurred by the ship are estimated at 3500 FF.

Exhibit 13

Total Port Expenses - Le Havre

Vessel: 31,000 G.R.T. (1,800 TEU)

Draft: 10.5 meters

Time in Port: 18 hours

			Cost per Call F.F.
Pilotage			
	In	8520	17,040
	Out	8520	
Tugs			
	In:	20,000	40,000
	Out:	20,000	
Handling Lines			3,000
Port Dues			70,700
Agency Fees			4,000
Other : Miscellaneous			3,500
Total Cost per Call			138,240

8.2 Container Handling Expenses

The cargo for this port as per designated vessel cargo distribution is: 150 boxes inward plus 50 empty or a total of 265 TEUs and outward 200 boxes full and 265 TEUs. The total estimated tonnage is 5250 with an allotted time in port of 18 hours as outlined in the designated vessel's schedule. Productivity levels of 140-150 boxes per shift period are said to be attained at this port. We have used a more conservative productivity of 20 boxes per gang hour.

Total container handling expenses developed for this port are shown in Exhibit XIV and are calculated in French Francs.

8.2.1 Container Box Rate

Terminal operators charge for the handling of containers on a box rate basis. This rate is negotiated between the carrier and the terminal operator and depends upon the annual volume frequency and class of ship.

The negotiated box rate at this port generally covers the following tasks:

Load and unload, full, empty, 20 ft. or 40 ft. from ship to stack and vice versa.
Lashing and unlashing
A work period covering two six hour shifts Monday to Saturday.

We have developed a box rate for the above tasks of 500 FF per box.

Cost of handling boxes in straight time:

In 200 boxes @ 500 FF = 100,000
Out 200 boxes @ 500 FF = 100,000

8.2.2 Receiving and Delivery

This expense covers the cost of receiving and delivering of containers within the terminal and includes gate charge in and out, tally computer work, clerking, shipplanning, etc., these tasks not being included in the box rate at this port.

We have estimated a rate of 200 FF per box on all containers, resulting in a total cost for this task of:

In: 200 boxes @ 200 FF =	40,000
Out: 200 boxes @ 200 FF =	40,000
	80,000

8.2.3 Overtime Differential

The amount of boxes to be discharged and loaded by the designated vessel at this port can be handled during the two shift periods within the time allotted to this port by the schedule. Whether all the work can be done during the straight time period would depend on the vessel's arrival time. We have therefore estimated a night shift period for two gangs to cover such a contingency.

The overtime supplement per shift (6 hours) per gang is 12,000 FF for week day nights rising to 20,000 FF for Sunday nights.

We have estimated an overtime expense of 24,000 FF.

8.2.4 Lost Time

This expense is incurred when stevedore gangs are unable to work due to any delays caused by the ship.

The cost per gang hour is 4000 FF. We have estimated 2 gang hours of lost time at a cost of 8000 FF.

8.2.5 Extra Labour

This expense is incurred for additional tasks not included in the box rate, such as removing damaged containers or shifting boxes from bays, landing them or restowing. When discharging a part cargo, such tasks will tend to be incurred.

An estimate of 2 gang hours or 8000 FF has been allowed.

8.2.6 Cargo or Tonnage Dues

This is assessed on full containers depending upon container size, with different tariffs being applied to inward and outward cargo.

Tariffs on imported full containers:

6 meters to less than 8 meters	49.30 FF per box
10 meters and over	86.40 FF per box

Exports:

6 meters to less than 8 meters	30.00 FF per box
10 meters and over	52.00 FF per box.

On the basis of 150 full boxes in and 200 out, we have estimated a cost of 19,000 FF.

Exhibit XIV

Container Handling Expenses - Le Havre

Cargo: Inward: 150 boxes full + 50 empty   Out: 200 boxes (265 TEUs)

Total In & Out: 400 boxes or 530 TEUs (464 TEUs full)

Time in Port: 18 hours   Productivity: 20 boxes per gang/hr.

		Handling Costs French Francs*
Container Box Rate		
In:	200 @ 500 = 100,000	200,000
Out:	200 @ 500 = 100,000	
Receiving & Delivery		80,000
Overtime Differential		24,000
Lost Time		8,000
Extra Labour		8,000
Tonnage Dues		19,000
Total Cargo Handling Cost		339,000

Cost per box handled: 848 FF   Cost per TEU handled: 640 FF

If cost of handling empty containers allocated to full boxes:

Adjusted cost per box: 969 FF   Adjusted cost per TEU: 731 FF

* Nearest Franc.

SECTION II

This section of the report deals with the update of relevant cost elements contained in the original study, Phase I, bringing them to 1985 cost levels.

Chapter 9

Montreal & Felixstowe 1985 Cost

9.1 Introduction

This chapter deals with updating the port and container handling expenses developed for Montreal and Felixstowe, in Phase I of the study. Those expenses were based on 1984 costs. This chapter updates these to 1985 costs.

9.2 Montreal Port Expenses

The port expenses developed in Phase I of the study for the Montreal port call of the designated vessel totaled \$25,057 and \$37,706 per winter call (see page 69, Exhibit 16, in Phase I of study). The expenses developed for 1985 are shown in Exhibit XV. These have been developed using the same assumptions plus adjustments for the 1985 tariffs where applicable. This results in adjusted total port expenses per call of \$26,188 and \$39,049 per winter port call.

9.3 Montreal Container Handling Costs

The container handling expenses developed in Phase I of the study for Montreal totaled \$673,484 or a unit cost of \$249.44 per box (see Exhibit 18 on page 84 of original study). The adjusted costs for 1985, using the same assumption and applying increases and adjustments where applicable, are shown on Exhibit XVI.

As will be seen for the accompanying exhibit, the 1985 costs are lower due mainly to the reduction of the MEA Assessment. This was reduced to \$1.88 per ton for 1985 as against the \$3.47 per ton assessed in 1984. The box rate remains the same, however, other charges have been increased as per the new labour agreement.

9.4 Felixstowe - Port Expenses

The port expenses developed in the original study for the Felixstowe port calls by the designated vessel was £17,476 per call, (see Exhibit 17 on page 75). The expenses developed for 1985 for the designated vessel are shown on Exhibit XVII. These reflect adjustments and increases where applicable.

9.5 Felixstowe - Container Handling Expenses

The 1984 container handling costs developed in the original study for Felixstowe was £ 59,770 or £92.00 per box. Using the same assumptions but applying labour increases and adjustments where applicable, the 1985 container handling charges are shown on Exhibit XVIII.

9.6 Comparative Port Expenses and Container Handling Charges

Exhibit XIX shows the 1985 port expenses and container handling charges, developed in this study for the designated container vessel for the ports of:

Montreal
Halifax
St-John, N.B.
New York
Baltimore
Felixstowe (1st call)
Felixstowe (2nd call)
Antwerp
Hamburg
Le Havre

All costs have been developed and calculated in the local curency and converted to U.S. dollars. The exchange rates used are as per rates shown on Exhibit XX.

It will be seen from Exhibit XIX that the highest unit cost for handling containers in the ports under study is New York while the lowest is Antwerp. Port expenses developed for the nine ports shows Halifax at the lower end of the scale.

Exhibit XV

Port Expenses - Montreal

Vessel: 31,000 G.R.T. (1,800 TEUs) Draft: 10.5 meters

Time in Port: 84 hrs.

	Cost per Call in $ Can.*	
Pilotage	9,993	x
Tugs	2,868	+
Handling Lines	1,860	
Harbour Dues	1,206	
Dockage Dues	5,003	
Shipping Federation Dues	225	
Agency Fees	3,983	
Other	1,050	
Total Port Expenses per Call	$ 26,188	

* Rounded to nearest dollar
x In winter increases to $19,987
+ In winter increases to $5,736

Exhibit XVI

Container Handling Expenses - Montreal

Cargo Inward: 1,350 boxes Outward: 950 boxes + 400 Empty

Total Inward & Outward: 2,700 boxes or 3,600 TEUs (incl. 536 TEU empty)

Total Time in Port: 84 hrs Productivity: 20 boxes

	Handling Costs in $Can.*
Container Box Rate	405,000
Overtime differential	38,177
Lost Time	3,539
Extra Labour	1,896
Securing	12,133
MEA Assessment	64,860
Wharfage	77,625
Railway Switching	20,302
Total Container Handling Expenses	$ 623,532

Unit Cost per box: $231 Unit Cost per TEU: $173

If costs of handling empty containers are allocated to full boxes or TEUs:

Adjusted cost per box: $271 Adjusted Cost per TEU: $204

* All rounded to nearest dollar.

Exhibit XVII

Port Expenses - Felixstowe - 1985

Vessel: 31,000 G.R.T. (1,800 TEUs) Draft: 10.5 meters

Time in Port: 24 hrs.

	Cost per Call in Ł
Pilotage	1,200
Tugs	4,247
Handling Lines & Mooring	665
Harbour Dues	4,675
Light Dues	6,830
Agency Fees	300
Other	110
Total Port Expenses per Call	Ł 18,027

Cost of 2nd call at Felixstowe: Ł18,027.

Exhibit XVIII

Container Handling Expenses - Felixstowe
1985 Update

Cargo Inward: 650 boxes (200 empty) Outward: Nil

Total Inward & Outward: 650 boxes or 870 TEUs (incl. 271 empty)

Total Time in Port: 24 hrs

	Handling Costs in £
Container Box Rate	55,900
Overtime differential	3,548
Lost Time & Detention	720
Extra Labour	538
Securing	538
Berthing Fee	2,800
Total Container Handling Expenses	£ 64,044

Unit Cost per box: £98.53 Unit Cost per TEU: £73.61

If costs of handling empty containers are allocated to full boxes or TEUs:
Adjusted cost per box: $142.32 Adjusted Cost per TEU: £106.92

2nd call

Cargo Inward: Nil Outward: 550 boxes

Total Inward & Outward: 550 boxes or 735 TEUs

Total Time in Port: 24 hrs

Total Cargo Handling Cost: £54,192

Unit cost per box: £98.53 Unit cost per TEU: £73.61

Exhibit XIX

COMPARATIVE TABLE OF PORT & CONTAINER HANDLING EXPENSES

Basis 18,000 T.E.U. Container Vessel - 1985 Costs

	Montreal	Halifax	Saint-John	New York	Baltimore	Felixtowe 1st Call	Felixtowe 2nd Call	Antwerp	Hamburg	Le Havre
Port Expenses										
Time in Port	84 hrs	84 hrs	84 hrs	84 hrs	84 hrs	24 hrs	20 hrs	30 hrs	18 hrs	18 hrs
Total Cost per Call	Can$26,188	Can$17,234	Can$18,904	US$30,280	US$30,390	£18,027	£18,027	BF1,360,700	DM55,800	FF138,240
Total Cost in US$	19,256	12,672	13,900	30,280	30,390	25,959	25,959	25,625	21,338	17,323
Container Handling Costs										
Total Cost In & Out (incl. empty)	2,700	2,700	2,700	2,700	2,700	650	550	700	400	400
Total TEU's In & Out	3,600	3,600	3,600	3,600	3,600	870	735	935	530	530
N° of Empty Boxes/TEU	400/536	400/536	400/536	400/536	400/536	200/271	-	100/133	50/66	50/66
Total Cost per Call	Can$623,532	Can$508,836	CAN$508,730	US$955,162	US$621,275	£64,044	£54,192	BF2,496,450	DM129,000	FF339,000
Unit Cost per Box	231	188	188	354	230	£98.5	£98.5	BF3,566	DM323	FF848
Unit Cost per TEU	173	141	141	265	173	£73.6	£73.7	BF2,670	DM243	FF640
Total Cost in US$	458,479	374,144	374,066	955,162	621,275	92,223	78,036	47,014	49,331	42,481
Unit Cost per Box US$	169.8	138.6	138.6	354	230	141.9	141.9	67.2	123.3	106.2
Unit Cost per TEU US$	127.4	103.9	103.9	265	173	106	106.2	50.3	93.1	80.2

Note: Exchange Rates as per Exhibit XX.

Exhibit XX

Exchange Rates Used in Phase II of Study

Sterling £1 = $1.44 U.S.

U.S. $1 = $1.36 Canadian

U.S. $1 = 7.98 French Francs

U.S. $1 = 53.1 Belgian Francs

U.S. $1 = 2.615 D.M.

U.S. $1 = 211.25 Japanese Yen

Chapter 10

Phase I Capital and Vessel Operating Costs Update

10.1 General

This chapter deals with the update of the various elements of operating and capital costs developed in Phase I of the study and the subsequent revision of the "Daily Vessel Cost Calculation" and "Voyage Cost Calculation".

10.2 Capital Costs

The main elements of capital costs used in the study are the cost of the designated 1,800 TEU cellular container vessel and the cost of 3 sets of containers, for each vessel.

10.2.1 Designated Vessel

The capital cost of the designated ice strengthened container vessel developed in Phase I of the study was US$37.4 million plus interest cost of $14.81 million per vessel. After consultations with our various industry sources as well as reviewing data on new vessel orders, it was felt that the price developed in the study reflects current prices as well as the competitive climate and overcapacity of the shipbuilding industry worldwide. As such, the capital cost of the vessel remains the same (see Exhibit 8 page 46 in Phase I).

10.2.2 Allocation of Ice Strengthened Vessel Capital Cost

The allocation of US$3,480,667 per annum per ship remains the same as indicated in Phase I of the study (see Chapter 7, section 7.8 page 63) and is shown in the "Revised Daily Vessel Cost Calculation, Ice Strengthened Vessel", Exhibit XXI.

10.3 Container Inventory

The assumptions made in Phase I, with regard to the number of sets of containers per vessel, breakdown of types and sizes, require no adjustment or change. However, after various consultations with industry sources, it was felt that the price developed in Phase I for the 40ft. steel reefer container should be adjusted upwards and as a result we have estimated the following container prices:

20ft. steel container	U.S.$3,000
40ft. steel containers	U.S.$3,600
Half height 20ft. steel cont.	U.S.$3,000
40ft. steel reefer cont.	U.S.$30,000

These prices are based on volume purchases and can most probably be improved upon in the event of an actual order for the quantity envisaged for the designated fleet. The price of US$30,000 for a 40ft. steel reefer container is based on a diesel/electric reefer unit. Container line operators in this trade are now replacing combination diesel/electric reefer units with all electric units. These are cheaper and can be purchased at around US$20,000 per unit.

For the purpose of our study, we have taken the more cautious approach and used the higher cost figure of US$30,000 per unit.

10.3.1 Cost of Container Inventory

The assumptions made in Phase I of the study regarding container inventory remain the same (see Chapter 5.5 page 31). In applying the revised costing, this results in the following cost.

						US$
840 x 3 sets x 4 ships =	10,080	20ft.	x	$ 3,000	=	30,240,000
60 x 3 sets x 4 ships =	720	half heights	x	$ 3,000	=	2,160,000
20 x 3 sets x 4 ships =	240	reefer 40ft.	x	$30,000	=	7,200,000
430 x 3 sets x 4 ships =	5,150	40ft.	x	3,600	=	18,576,000
	16,200	boxes (21,600 TEU)				58,176,000

10.3.1 Cost of Container Inventory (cont'd)

The previous assumption of the financing package remains. The financing cost calculation, resulting in the revised total cost of the container inventory, is shown on Exhibit XXII. It should be noted that a container manufacturer, faced with such a large order in this competitive market, can offer more competitive terms and prices than those we have used in our calculations.

10.3.2 Container Inventory Insurance

This element of expense is directly related to the value of the container inventory. The rate of 0.25% remains and results in the following gross insurance premium:

$58,176,000 x 0.25 of 1% = U.S.$145,440.

10.3.3 Container Repairs and Maintenance

Due to the higher inventory cost and the high cost of maintaining the reefer boxes, we have adjusted the total cost of repairs and maintenance to $4,005,000 per annum. This equates to $250 per box or 6.96% of capital cost.

10.3.4 Allocation of Container Equipment & Related Costs

This covers the revised cost of the container inventory together with the financing cost as shown on Exhibit XXIII. The total inventory cost including financing is $84,369,200. This is amortized over 10 years and allocated on an annual basis to each ship. This amounts to $2,109,230 per ship per annum. This annual allocation by vessel is shown in Exhibit XXIII as part of the "Revised Daily Vessel Cost Calculation".

10.3.5 Positioning of Empty Containers

The allocation of $80,000 per voyage applied to the "Revised Voyage Expense Calculation" Exhibit XXIII remains the same as that developed in Phase I.

10.3.6 Repairs, Maintenance and Insurance

The revised annual cost is allocated on a per voyage basis.

	US$
Insurance Total Loss & Third Party Liability	145,465
Revised Repairs and Maintenance	4,050,000
Annual Cost over Fleet	$4,195,465

This cost is allocated on a per voyage basis:

4 ships x 13 voyages - 52 voyages per annum
Allocation per voyage = $80,682

This amount forms part of the "Revised Voyage Expense Calculation" Exhibit XXIII.

10.4 Vessel Operating Costs Update

This deals with those items of operating expenses that require adjustment only. All assumptions made in Phase I of the study remain as stated.

10.4.1 Crewing

The crewing cost for the British Flag designated container vessel for 1984 was Ŀ 546,000. The cost developed for 1985 for the same vessel with a crew of 28 is Ŀ 579,000 plus Ŀ35,000 for crew changes and medical expenses, or US$833,760 + US$50,400.

10.4.2 Insurance Premiums

Deductibles and P&I insurance premiums developed in Phase I remain the same.

10.4.3 Repairs and Maintenance

The adjustment on this item of expense is due to the cross exchange rate. the cost developed is Ŀ210,000 per annum.

10.4.4 Stores, Spares and Supplies

The revised cost for these items are due to increased costs and the effect of cross exchange rates. The various items of expense have been adjusted and are shown in "Revised Daily Vessel Operating Cost" Exhibit XXII.

10.4.4.1 Lubricating Oil

The revised cost for this item is:

Annual consumption: 38,000 gallons @ US$4.05 = $153,900.

10.4.4.2 Victualing

The per diem rate is increased to £2.94 or £30,047 per annum.

10.4.5 General and Administrative Expenses

These cover cost items with respect to the management of the vessel. The original sterling costs have been updated to 1985 levels and these are shown in Exhibit XXII.

10.5 Vessel Operating Costs

The revised Total Vessel Operating Costs for the Designated Ice Strengthened Vessel are shown on Exhibit XXII.

10.6 Voyage Expenses

This section deals with the calculation of the total voyage expenses expressed on a round trip voyage basis i.e. Sailing from Montreal to Felixstowe - Hamburg - Antwerp -Felixstowe - Le Havre and returning to Montreal. The assumptions developed in Phase I of the study remains the same with the exceptions of the following subsections which explain any revisions or adjustments.

10.6.1 Daily Vessel Cost Factor - Ice Strengthened Vessel

This factor as explained in Phase I of the study consists of three principle elements: the vessel operating cost, vessel amortization cost and container equipment cost; these are found in the "Revised Daily Vessel Cost Calculation", Exhibit XXII. The vessel amortisation cost remains the same; however, as explained elsewhere, we have adjusted the Vessel Operating Cost and Container Equipment Cost.

Vessel Operating Cost	US$5,538	per day
Vessel Amortization Cost	9,722	"
Container Equipment Cost	5,892	"
Total Vessel Cost Factor	$21,152	per day

This daily vessel cost factor is used in our calculations of vessel's voyage cost.

10.6.2 Bunkering

The bunkering pattern for our designated vessel on her schedule called for the vessel to bunker at Montreal for the round trip. Although this was true in 1984, present liner operator practices calls for their vessels to bunker in Europe due to the more competitive pricing. In view of this, we have revised the bunkering pattern of our designated vessel and we have her bunkering in Antwerp for the round trip.

We have revised our fuel price to reflect current levels and have used the following prices in our calculations:

Intermediate fuel Redwood 1500	US$144 per ton
OMD	US$235 per ton

10.6.3 Fuel Cost Calculation

The fuel consumption developed for the designated vessel remains the same, namely 50 tons of intermediate fuel per 24 hrs plus 2.5 tons of OMD when vessel is steaming and 2.5 tons of OMD when vessel is in port. The voyage calculation calls for 19.11 sea days @ 50 tons per day = 9,555 tons of intermediate fuel plus 2.5 tons of OMD for 28 days = 70 tons.

10.6.4 Port Charges

These have been calculated in detail elsewhere in this study to 1985 levels and, as such, they revise the original figures used in Phase I of the study which were based on 1984 costs for Montreal, Felixstowe, while for the other European ports, Felixstowe costs were used. Phase II of the study has now developed costs for each port.

10.6.5 Port Expenses

These as calculated elsewhere are summarized as follows:

						US$
Montreal	Can$	26,188	U.S. exch. @	1.36	=	19,256
Felixstowe	£	18,027	"	1.44	=	25,959
Hamburg	DM	55,800	"	2,615	=	21,338
Antwerp	BF	1,360,700	"	53.1	=	25,625
Felixstowe	£	18,027	"	1.44	=	25,959
Le Havre	FF	138,240	"	7.98	=	17,323

10.6.6 Cargo Expenses

These have been claculated elsewhere and are summarized as follows:

						US$
Montreal	CAN$	623,532	US exch. @	1.36	=	458,479
Felixstowe	£	64,044	"	1.44	=	92,223
Hamburg	DM	129,000	"	2,615	=	49,331
Antwerp	BF	2,496,450	"	53.1	=	47,014
Felixstowe	£	54,192	"	1.44	=	78,036
Le Havre	FF	339,000	"	7.98	=	42,481

10.6.7 Container Maintenance, Repairs & Insurance

As explained elsewhere we have allocated the cost of this on a per voyage basis amounting to US$80,682 per voyage.

10.6.8 Positioning of Empty Containers

As indicated in Phase I of the study, we have estimated this at $80,000 per voyage.

10.7 Voyage Expense Calculation

This calculation is shown on Exhibit XXIII. It includes all elements of costs incurred in the operating of a voyage and management of the ship with the exception of inland transportation and cost of selling. The revised cost per voyage (shown on Exhibit XXIII) amounts to US$1,810,000 or $502.78 per T.E.U. transported. This compares with the previous total cost per voyage developed in Phase I of US$1,881,089 or $522.52 per unit. Although costs were increased where required and actual costs developed for the European ports, the overall cost per voyage is down on the 1984 estimate due to the impact of cross exchange rate fluctuations, reduction of MEA charges in the port of Montreal and lower fuel costs.

Exhibit XXI

CONTAINER INVENTORY FINANCING COST

Interest at 10% - 8 1/2 yrs

Payment No.		Principal	Principal Payment	Interest Payment	Total Payment
Delivery		US$14.5465 m.			
6 mo.	1	13.6908	.8557	.7273	1.5830
12 mo.	2	12.8350	.8557	.6845	1.5402
1 1/2 y.	3	11.9794	.8557	.6418	1.4975
2	4	10.2680	.8557	.5562	1.4119
2 1/2	5	10.2680	.8557	.5562	1.4119
3	6	9.4123	.8557	.5134	1.3691
3 1/2	7	8.5566	.8557	.4706	1.3263
4	8	7.7009	.8557	.4278	1.2835
4 1/2	9	6.8452	.8557	.3850	1.2407
5	10	5.9895	.8557	.3423	1.1980
5 1/2	11	5.1338	.8557	.2995	1.1552
6	12	4.2781	.8557	.2567	1.1124
6 1/2	13	3.4224	.8557	.2139	1.0696
7	14	2.5667	.8557	.1711	1.0268
7 1/2	15	1.7110	.8557	.1283	.9840
8	16	.8553	.8557	.0856	.9413
8 1/2	17	-	.8557	.0428	.8985
Cost of 3 sets of containers for 4 ships			14.5465	$6.65458	$21.0927 per ship

Total Cost of Inventory	
No. of containers (3sets x 4ships)	16,200
Total capital cost	US$58,186,000
Total interest cost	26,183,200
Total cost	US$84,369,200

Exhibit XXII

DAILY VESSEL COST CALCULATION - 1985

Designated Ice Strengthened Vessel

Service Speed: 17 kts　　Consumption: 50 tons + 2.5 tons OMD

G.R.T. 31,000　　Capacity: 1800 T.E.U.

Operating days: 365 (Less 14 days biennial Refit) = 358 service days

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	Yearly US$		Daily
Crewing			
Crew	833,760	884,160	2,470
Crew changes, Medical & Other	50,400		
Insurance			
Hull & machinery	225,000	337,000	941
P&I (incl. supplementary calls)	62,000		
War risk, strikes	19,000		
Deductible	31,000		
Repairs & Maintenance			
Drydocking provisions (half of biennial)	172,800	302,400	845
Voyage, running & other maint. provisions	129,600		
Stores & Spares & Supplies			
Deck spares	24,192	338,652	946
Engine	15,120		
Spares, incl. transport	72,000		
Lube oil	153,900		
Catering supplies	19,656		
Vitualing	43,200		
Water & Other	10,584		
General Admin. & Other			
Management	98,280	120,400	336
Rentals	3,500		
Communication	3,500		
Sundries	15,120		
Vessel Operating Costs		$1,982,612	$ 5,538
Capital Annual Vessel Amortisation Rate*		3,480,667	9,722
Capital Containers+		2,109,230	5,892
Total Cost, incl. Capital	US$	7,572,505	$ 21,152**

* Straight line over 15 years

+ Straight line over 10 years.

** Rounded

Exhibit XXIII

REVISED VOYAGE EXPENSE CALCULATION

VESSEL: "DESIGNATED CONTAINER" **DATE:** January 1986

Speed: 17 knots on 50 tons Int + 2 1/2 tons OMD fuel

		STEAMING	IN PORT
	Montreal	-	3.50
	Felixstowe	7.92	1.00
	Hamburg	.88	.75
	Antwerp	.92	1.25
	Felixstowe	.34	.83
	LeHavre	.49	.75
	Montreal	7.65	-
		18.20	8.08
	Delays	.91	.81
28	Total Days	19.11	8.89

(Fixed Chgs)

					US$
Vessel Cost:	28 days - @ $21,152 per day				$ 592,256
Fuel: Int. 1500	19.11 days @ 50 tons	955.5	@ $144 =	137,592	
OMD	28.00 days @ 2.5 tons	70.0	@ $235 =	16,450	154,042

PORTS OF CALL

	US$ Port Chgs	US$ Cargo Chgs		
Montreal	$ 19,256	458,479		
Felixstowe	25,959	92,223		
Hamburg	21,338	49,331		
Antwerp	25,625	47,014		
Felixstowe	25,959	78,036		
LeHavre	17,323	42,481		
	$ 135,460	$ 767,564	=	903,024

ALLOCATIONS

Container Repair & Insurance	$ 80,862	
Positioning of Empty Containers	$ 80,000	
Sub Total	$ 160,682	160,682
TOTAL VOYAGE EXPENSES		$1,810,004

Total Boxes: 2,700

Total T.E.U.: 3,600

Unit Cost per box: US$670.37

Unit Cost per T.E.U.: $502.78

SECTION III

This section of the study describes and calculates the effect of:

a) Substituting the North American load/discharge port of Montreal with Halifax and with New York.

b) Substituting a single load port with four North American port calls, to obtain a general indication of costs and voyage pattern of a North Atlantic Triangular Container Service with data and assumptions developed elsewhere in this study.

Chapter 11

Revised North American Port Itinerary

11.1 General

This chapter deals with identifying the differences and resultant cost variances on the Voyage Expense Calculation when the North American Load and Discharge port is changed.

The Revised Voyage Expense Calculation, Exhibit XXIII in Chapter 10 illustrates the designated voyage with Montreal as the North American Load/Discharge port. This chapter will deal with substituting Montreal with Halifax and with New York.

11.2 Revised Designated Route - Halifax

For the purpose of identifying the variances in cost and ships time on a North Atlantic voyage, substituting Halifax for Montreal, we have retained all the same assumptions with respect to time in port, productivity, European port itinerary, container types and quantity, cargo distribution. All costs with respect to the other ports remain the same.

Port expenses and container handling costs are dealt with in detail in Chapter 2 and these figures are used in our calculations. The major element of cost that impacts on the change in intinerary will be the capital cost of the vessel in that an ice strengthened vessel will not be required for either Halifax or New York.

11.2.1 Non Ice Strengthened Container Vessel

The cost of the basic non ice strengthened designated vessel was developed in Phase I (see Exhibit 7 page 44) where the cost was estimated at US$36 million.

In Chapter 10 of this study, we indicated that the capital costs developed in Phase I require no change as they still reflect current prices and as such the capital cost of the non ice strengthened designated container vessel remains at $36 million. The total

Exhibit XXIV

DESIGNATED VESSEL - SHIP FINANCING COST
CAPITAL COST $36,000,000 NON ICE STRENGTHENED

Payment No		80% Loan 7 3/4% Interest				20% Equity 13% Interest				TOTALS
		Principal	Principal Payment	Interest Payment	Total Payment	Equity	Equity Payment	Interest Payment	Total Payment	US Dollars '000
Delivery		$28.800				$7.20000				
6 mo.	1	27.1059	1.6941	1.1160	2.8101	6.7765	.4235	.4680	.8915	3.7016
1 yr	2	25.4118	1.6941	1.0504	2.7445	6.3530	.4235	.4405	.8640	3.6085
1 1/2	3	23.7177	1.6941	0.9847	2.6788	5.9295	.4235	.4129	.8364	3.5152
2	4	22.0236	1.6941	0.9191	2.6132	5.5060	.4235	.3854	.8089	3.4221
2 1/2	5	20.3275	1.6941	0.8534	2.5475	5.0825	.4235	.3579	.7814	3.3289
3	6	18.6354	1.6941	.7878	2.4819	4.6590	.4235	.3304	.7539	3.2358
3 1/2	7	16.9413	1.6941	.7221	2.4162	4.2355	.4235	.3028	.7263	3.1425
4	8	15.2472	1.6941	.6565	2.3506	3.8120	.4235	.2753	.6988	3.0494
4 1/2	9	13.5531	1.6941	.5908	2.2849	3.3885	.4235	.2478	.6713	2.9562
5	10	11.8590	1.6941	.5252	2.2193	2.9650	.4235	.2203	.6438	2.8631
5 1/2	11	10.1649	1.6941	.4595	2.1536	2.5415	.4235	.1927	.6162	2.7698
6	12	8.4708	1.6941	.3939	2.0880	2.1180	.4235	.1652	.5887	2.6767
6 1/2	13	6.7767	1.6941	.3282	2.0223	1.6945	.4235	.1377	.5612	2.5835
7	14	5.0826	1.6941	.2626	1.9567	1.2710	.4235	.1101	.5336	2.4903
7 1/2	15	3.3885	1.6941	.1970	1.8911	.8475	.4235	.0826	.5061	2.3972
8	16	1.6941	1.6941	.1313	1.8254	.4235	.4235	.0551	.4786	2.3040
8 1/2	17	-0-	1.6941	.0656	1.7597	-0-	.4235	.0275	.4510	2.2107
Total			28.7997	10.0441	38.8438		7.1999	4.2122	11.4117	50.2555

Blended Average Interest Rate (on declining balance): 4.40% per half year, 8.80% per annum.

11.2.1 Non-Ice Strengthened Vessel (cont'd)

cost of the basic vessel including financing costs is shown in Exhibit XXIV. Financing costs have been calculated using the same assumptions as those developed for the ice strengthened vessel.

As can be seen from our calculation in Exhibit XXIV, the total cost of the vessel including interest cost is US$50.256 million.

11.2.2 Basic Vessel Operating Costs

All operating costs as developed for the ice strengthened vessel remain the same with the exceptions of insurance premiums due to the lower capital cost and the annual vessel amortization rate.

11.2.2.1 Insurance Premiums

Reducing the vessel's capital cost results in a lower hull & machinery total loss premium as the calculation developed in Phase I is based on the hull value; revised premium is US$216,000. P&I premiums and insurance deductible provisions remain the same. However, war risk premiums being based on the capital value of the vessel is revised to US$18,000.

11.2.2.2 Vessel Amortization Rate

As with the designated ice strengthened vessel, the amortization rate has been taken over the life of the vessel with no residual value that is straight line over 15 years. The annual amortization rate for the basic vessel, having a total cost of US$50.2555 million is $3,350,366 per annum.

11.2.3 Daily Vessel Cost Calculation

The adjusted Daily Vessel Cost Calculation is shown in Exhibit XXV. This shows an annual cost of $7,432,208 per annum or US$20,760 per day. The number of operating days remain the same at 358 days per annum.

11.2.4 Voyage Expenses

The main components are the daily vessel cost factor, ship's time steaming and time in port, fuel cost, port expenses and container handling costs for each port of call plus allocation to voyage cost of container maintenance and insurance and positioning of empty containers.

11.2.4.1 Ship's Time

Steaming time for the revised itinerary has been recalculated to reflect the difference in distance utilizing the average speed developed in Phase I. All assumptions with respect to port time remain the same and as such no change in port time is reflected and remains at 8.89 days including delays, steaming time used in the calculation is as follows:

Halifax	- Felixstowe	2747	nautical miles	or	6.73	days
Felixstowe	- Hamburg	360	nautical miles	or	.88	"
Hamburg	- Antwerp	376	nautical miles	or	.92	"
Antwerp	- Felixstowe	138	nautical miles	or	.34	"
Felixstowe	- Le Havre	200	nautical miles	or	.49	"
Le Havre	- Halifax	2610	nautical miles	or	6.40	"
					15.76	days

To this total of 15.76 days, an allowance for weather delays of 0.79 days is added making a total of 16.55 steaming days. Total ship's time including time in port is 25.44 days.

11.2.4.2 Fuel

The fuel consumption has been recalculated to reflect the change in the total voyage days and actual steaming days. Total fuel consumption for this voyage is 827.50 tons of Int. 1500, plus 63.6 tons of O.M.D. Fuel prices used are those developed in Chapter 10.5.3.

11.2.4.3 Port and Container Handling Charges

The costs used in this calculation are those that have been developed in previous chapters of this report for the various ports.

11.2.4.4 Allocation

The estimated allocation for container maintenance and insurance as well as the positioning of empty containers on a per voyage basis remains the same.

11.2.5 Voyage Expense Calculation

The total expenses for the revised itinerary with Halifax as the Canadian load/discharge port is shown in Exhibit XXVI. It will be seen from the calculation that the total cost of 1985 voyage via Halifax costs $1,635,027 or US$454.17 per T.E.U. as against $1,810,004 or US$502.78 per T.E.U. for the same number of T.E.U.s transported. There is also an apparent saving of 2.56 ship days per voyage resulting in an extra voyage per annum being achieved by each ship. It would not, however, reduce the designated fleet of 4 ships to 3, if the designated line maintains the industry practice of weekly sailing it must offer 52 sailings per annum.

As discussed in Phase I, container lines tend to operate on 21 or 28 day cycles. In actual practice, any gain in days may be used to eliminate overtime work. Further, it is a moot point if a line could maintain a weekly service to and from Halifax with the volume of 3600 T.E.U.s per call and if shipping would in fact route cargoes from the Mid West of the United States through Halifax. This aspect has not been examined by this study.

11.3 Revised Itinerary - New York

As indicated earlier in this chapter, the original designated vessel itinerary is altered to substitute New York for the Montreal call.

All the assumptions and comments made in the preceeding subsections regarding the substitution of Halifax apply including the capital cost. The only difference to apply

11.3 Revised Itinerary - New York (cont'd)

to the voyage calculation, Exhibit XXVI, is the steaming time in respect of the distance to and from New York. This also affects the fuel calculation. These have all been calculated and applied directly to the Revised Itinerary II - Voyage Expense Calculation - Exhibit XXVIII.

11.3.1 Basic Vessel Operating Cost

All elements of vessel operating costs remain the same as those shown in Exhibit XXV "Daily Vessel Cost Calculation - Non Ice Strengthened Vessel - 1985".

11.3.2 Voyage Expenses

The components are as described in 11.2.3. The elements that have been recalculated are described in the following subsections.

11.3.2.1 Ship's Time

Steaming time for the revised itinerary with New York as the single North American load/discharge port has been recalculated to reflect the difference in distances. The speed assumed is that developed in Phase I.

The resultant steaming time is as follows:

New York	- Felixstowe	3322	nautical miles	or	8.14	days
Felixstowe	- Hamburg	360	nautical miles	or	.88	days
Hamburg	- Antwerp	376	nautical miles	or	.92	days
Antwerp	- Felixstowe	138	nautical miles	or	.34	days
Felixstowe	- Le Havre	200	nautical miles	or	.49	days
Le Havre	- New York	3161	nautical miles	or	7.75	
					18.52	days

11.3.2.1 Ship's Time (cont'd)

To this total of 18.52 days must be added an allowance for delays of .93 days making a total of 19.45 steaming days.

Assumptions with respect to time in port remains the same on this revised itinerary. As such, the time in port remains at 8.89 days including allowance for delays.

Total ship's time required for the voyage by this revised itinerary is 28.34 days.

11.3.2.2 Fuel

The fuel consumption has been recalculated to reflect the change in the steaming time and port time. This results in a total voyage fuel consumption of 972.5 tons of Intermediate plus 70.85 tons of O.M.D.

11.3.2.3 Port and Container Handling Charges

The costs used in this recalculation are those that have been developed in previous chapters of this study for the respective ports and summarized in Exhibit XIX.

11.3.2.4 Allocations

The allocations of costs for container maintenance and insurance, as well as the positioning of empty containers on a per voyage basis remains the same.

11.3.3 Voyage Expense Calculation

The total expenses for the revised itinerary with New York as the North American load/discharge port is shown in Exhibit XXVII. It will be seen that the 1985 estimated cost for such a voyage is US$2,316,441 or US$643.46 per T.E.U. transported as compared to US$454.17 via Halifax.

The total time utilized on the voyage equates to 28.34 days enabling the operator to maintain weekly sailings with 4 ships.

Exhibit XXV

DAILY VESSEL COST CALCULATION - 1985

Designated Vessel (non Ice Strenghtened)

Service Speed: 17 kts	Consumption: 50 tons + 2 1/2 tons OMD
G.R.T. 31,000	Capacity: 1800 T.E.U.

Operating days: 365 (Less 14 days biennial Refit) = 358 service days

	Yearly US$		Daily
Crewing			
Crew	833,760		
Crew changes, Medical & Other	50,400	884,160	2,470
Insurance			
Hull & machinery	216,000		
P&I (incl. supplementary calls)	62,000	327,000	913
War risk, strikes	18,000		
Deductible	31,000		
Repairs & Maintenance			
Drydocking provisions (half of biennial)	172,800	302,400	845
Voyage, running & other maint. provisions	129,600		
Stores & Spares & Supplies			
Deck spares	24,192		
Engine	15,120		
Spares, incl. transport	72,000		
Lube oil	153,900	338,652	946
Catering supplies	19,656		
Victualing	43,200		
Water & Other	10,584		
General Admin. & Other			
Management	98,280		
Rentals	3,500	120,400	336
Communication	3,500		
Sundries	15,120		
Vessel Operating Costs		$1,972,612	$ 5,510
Capital Annual Vessel Amortisation Rate*		3,350,366	9,358
Capital Containers+		2,109,230	5,892
Total Cost, incl. Capital	US$	7,432,208	$ 20,760**

* Straight line over 15 years

+ Straight line over 10 years.

**Rounded

Exhibit XXVI

Revised Itinerary - 1

VOYAGE EXPENSE CALCULATION

VESSEL: "DESIGNATED CONTAINER" **DATE:** December 1985

Speed: 17 knots on 50 tons Int + 2 1/2 tons OMD fuel per day

	STEAMING	IN PORT
Halifax	-	3.50
Felixstowe	6.73	1.00
Hamburg	.88	.75
Antwerp	.92	1.25
Felixstowe	.34	.83
LeHavre	.49	.75
Halifax	6.40	-
	15.76	8.08
Delays	.79	.81
Total Days	16.55	8.89

(Fixed Chgs)

					US$
Vessel Cost:	25.44 days - @ $20,760 per day				$ 528,134
Fuel: Int. 1500	16.55 days @ 50 tons	827.5	@ $144 =	119,160	
OMD	25.44 days @ 2.5 tons	63.0	@ $235 =	14,946	134,106

PORTS OF CALL

	US$			
	Port Chgs	Container Handling Chgs		
Halifax	$ 12,672	374,144		
Felixstowe	25,959	92,223		
Hamburg	21,338	49,331		
Antwerp	25,625	47,014		
Felixstowe	25,959	78,036		
LeHavre	17,323	42,481		
	$ 128,876	$ 683,229	=	812,105

ALLOCATIONS

Container Repair & Insurance	$ 80,862	
Positioning of Empty Containers	$ 80,000	
Sub Total	$160,682	160,682
TOTAL VOYAGE EXPENSES		$1,635,027

Total Boxes: 2,700 Total T.E.U.: 3,600

Unit Cost per box: US$605.57 Unit Cost per T.E.U.: $454.17

Exhibit XXVII

Revised Itinerary - II

VOYAGE EXPENSE CALCULATION

VESSEL: "DESIGNATED CONTAINER" **DATE:** December 1985

Speed: 17 knots on 50 tons Int + 2 1/2 tons OMD fuel per day

	STEAMING	IN PORT
New York	-	3.50
Felixstowe	8.14	1.00
Hamburg	.88	.75
Antwerp	.92	1.25
Felixstowe	.34	.83
LeHavre	.49	.75
New York	7.75	-
	18.52	8.08
Delays	.93	.81
Total Days	19.45	8.89

(Fixed Chgs)

						US$
Vessel Cost:	28.34 days - @ $20,760 per day					$ 588,338
Fuel: Int. 1500	19.45 days @ 50 tons	972.5	@ $144 =	140,040		
OMD	28.34 days @ 2.5 tons	70.85	@ $235 =	16,650		156,690

PORTS OF CALL

	US$		
	Port Chgs	Container Handling Chgs	
New York	$ 30,280	955,162	
Felixstowe	25,959	92,223	
Hamburg	21,338	49,331	
Antwerp	25,625	47,014	
Felixstowe	25,959	78,036	
LeHavre	17,323	42,481	
	$ 146,484	$1,264,247	= 1,410,731

ALLOCATIONS

Container Repair & Insurance	$ 80,862	
Positioning of Empty Containers	$ 80,000	
Sub Total	$ 160,682	160,682
TOTAL VOYAGE EXPENSES		$2,316,441

Total Boxes: 2,700 Total T.E.U.: 3,600

Unit Cost per box: US$857.94 Unit Cost per T.E.U.: $643.46

Chapter 12

Modified Triangular Service

12.1 Purpose

To provide an indication of North Atlantic Container Shipping Costs on a triangular service, i.e. Canada-U.S-North Europe, utilizing cost data developed in this study for the designated cellular container vessel. It should be noted that this is not meant to represent an in-depth study of that trade, but merely an indication based on assumptions and cost data developed in Phase I and II of the study.

12.2 Service and Frequency

Container shipping operators together with itineraries of triangular services between Canada and the U.S.A. to North Europe are described in Section 3.2.1 in Phase I of this study.

12.2.1 Frequency

An acceptable level of frequency in this competitive service is four sailings per month. For purposes of our study, we have adopted this assumption.

12.2.2 Service

As we are restricted to describing a triangular service based on data developed in this study, we have formulated the following itinerary:

Halifax		Felixstowe
New York		Hamburg
	to	
Baltimore		Antwerp
Halifax		Felixstowe
		Le Havre

12.2.2 Service (cont'd)

It will be noted that the vessel makes two calls at Halifax. The first call is for the discharge of Canadian and New England/U.S. Midwest bound containers, and the second call is to load Canadian export containers.

With two separate calls at Halifax, shippers are offered direct sailings to and from Europe. This aspect is also considered useful for reefer containers in that these containers remain on board for a shorter period. We understand that some vessels on this service are picking up Canadian-U.S. bound containers at Halifax for U.S. ports with commodities such as fish, tires, etc. This aspect has not been taken into account in our container distribution assumptions.

12.3 The Vessel

For the purpose of our study, the vessel we have utilized in this service is the Non-Ice Strengthened 1800 T.E.U. Cellular Container Vessel described in Chapter 11.

12.4 Container Cargo Distribution

The number of containers for and from Europe are those developed in Section 4.4 of Phase I. However, we have developed here a breakdown of the number of containers to be loaded and discharged at each North American port on our proposed triangular container service itinerary. This breakdown of containers is not based on an in-depth cargo flow study. Terms of reference on this phase of the study calls only for a general indication of such a service based on data and assumptions previously developed in this study. We have, however, taken some of the following factors into account in developing the proportion of containers to be discharged or loaded at each North American port:

a) Containers originating from the U.S. Midwest or bound for that region, is said to be both faster and cheaper if routed via Halifax than through either New York or Baltimore.

b) It has been indicated that approximately 40% of import cargo discharged at Halifax may be for U.S. destinations.

c) The imbalance in the East-West container trade is as described in Section 3.3 of Phase I.

12.4 Container Cargo Distribution (cont'd)

d) It has been indicated that the proportion of empty containers loaded at Halifax for Europe tends to be smaller than at the U.S. ports due to a greater proportion of export cargo being shipped out of the Canadian port.

e) The greater proportion of Westbound containers is said to be for the U.S. ports.

The container distribution after taking the above factors into consideration results in the following breakdown:

	Eastbound		Westbound	
	Boxes	T.E.U.s	Boxes	T.E.U.s
Halifax	400 + 70 empty	(533 + 94 empty)	470	(627)
New York	300 + 180 empty	(400 + 240 empty)	480	(640)
Baltimore	250 + 150 empty	(332 + 201 empty)	400	(533)
Total	950 + 400 empty	(1264 + 536 empty)	1350	(1800)

European Ports	Eastbound		Westbound	
	Boxes	(T.E.U.s)	Boxes	(T.E.U.s)
Felixstowe	450 + 200 empty	(599 + 271)	550	(735)
Hamburg	150 + 50 empty	(199 + 66)	200	(265)
Antwerp	200 + 100 empty	(267 + 133)	400	(535)
Le Havre	150 + 50 empty	(199 + 66)	200	(265)
Total In & Out	950 + 400	(1264 + 536)	1350	(1800)

12.5 Ships Time

Steaming time for the triangular service itinerary has been calculated to reflect the sequence of the port calls on the basis of a service speed of 17 kts. The resultant steaming time is as follows:

Halifax	- Felixstowe	2747	nautical miles	or	6.73	days
Felixstowe	- Hamburg	360	nautical miles	or	.88	"
Hamburg	- Antwerp	376	nautical miles	or	.92	"
Antwerp	- Felixstowe	138	nautical miles	or	.34	"
Felixstowe	- Le Havre	200	nautical miles	or	.49	"
Le Havre	- Halifax	2610	nautical miles	or	6.40	"
Halifax	- New York	593	nautical miles	or	1.45	"
New York	- Baltimore	412	nautical miles	or	1.01	"
Baltimore	- Halifax	892	nautical miles	or	2.19	"
					20.41	days

To this total, an allowance for delays of 1.02 days is added making a total of 21.43 steaming days.

12.5.1 Port Time

The time in port for loading and discharging containers on this triangular service voyage is as follows:

Halifax - Westbound - 470 boxes handled - time in port: 15 hrs.
New York - 480 boxes In + 480 boxes Out - Time in port: 30 hrs.
Baltimore - 400 boxes In + 400 boxes Out - Time in port: 25 hrs.
Halifax - Eastbound - 470 boxes - Time in Port: 15 hrs.

Time in port for the various European ports remains the same as those developed in Phase I of the study and are shown in Exhibit XXVIII.

The total ships time required for a round trip voyage including delays is 30.32 days. This would result in 48 sailings per annum with the 4 ships. A 28-day cycle could be maintained by:

12.5 Ships Time (cont'd)

a) Increasing speed to 19 kts. in which case the total time required per voyage would be 28 days.

or

b) Increasing the number of gangs working to reduce the total port time from 8.89 days to 6.57 days.

In both instances, extra costs will be incurred in either fuel or labour costs. Liner operators tend to use these elements if a vessel falls behind or when a vessel goes to refit, and the schedule is maintained by the other three ships.

12.6 Fuel

The fuel consumption for the voyage has been recalculated to reflect the itinerary and longer steaming time. This results in a total fuel consumption of 1071.5 tons of Int. 1500 plus 75.8 tons of OMD on the basis of a fuel consumption at 17 kts.

12.7 Container Handling Charges

The cost of handling containers for the North American ports on the itinerary has been calculated on the basis of the unit cost per box as summarized in Exhibit XIX.

12.7.1 Halifax - Port Expenses

We have used the port expenses developed in Chapter 2 of this study and shown in Exhibit XIX.

12.7.2 Halifax - Container Handling Cost

The unit cost per box developed in Chapter 2 of this study is summarized in Exhibit XIX is $Can 188 per box.

Container handling expenses - Halifax:

1st call: 470 @ $188 = Can$88,360 (US$64,971)
2nd call: 470 @ $188 = Can$88.360 (US$63,970)

12.7.3 New York - Port Expenses

The cost per call used is that developed in Chapter 4.

12.7.4 New York - Container Handling Expenses

The container handling costs used is based on the unit cost per box as developed in Chapter 4 of this study.

Containers handled per call at New York on triangular service:

480 boxes In + 300 full boxes Out + 180 empty =
960 @ $354 per box = US$339,840.

12.7.5 Container Handling Cost - Baltimore

The container handling cost used in this calculation is based on the unit cost per box as developed in Chapter 5 of this study.

Containers handled per call at Baltimore on triangular service:

400 boxes In + 250 boxes + 150 empty boxes Out:

Unit cost for handling container = US$230

800 @ $230 = US$184,000

12.7.6 European Ports

Port cargo expenses are developed in previous chapters of this study and are summarized in Exhibit XIX.

12.8 Voyage Expense Calculation

The total voyage expense calculation for the triangular container service described in this chapter is shown on Exhibit XXVIII. As will be seen, the total cost per voyage is US$2,127,319 as compared to US$1,810,004 with Montreal as the single North American load port, see Exhibit XXIII.

12.9 Conclusion

We have identified, defined and described all the relevant elements of expense, both fixed and variable, of an 1800 TEU cellular container vessel, engaged on the North Atlantic trade.

In order to complete the window on the industry, the cost of marketing and sales should be identified and described. Further, inland transportation costs, associated with the movement of containers from major pre-determined points in North America to the various ports described in this study should be identified, for comparative cost purposes, when evaluating the various port costs and shipping options.

We would suggest, in view of the increasing number of combination Container-Ro/Ro vessels utilized on the North Atlantic Container trade, that capital and operating costs of these vessels be identified and developed.

Exhibit XXVIII

Triangular Service Voyage

VOYAGE EXPENSE CALCULATION

VESSEL: "DESIGNATED CONTAINER" **DATE:** December 1985

Speed: 17 knots on 50 tons Int + 2 1/2 tons OMD fuel per day

	STEAMING	IN PORT
Halifax	-	.625
Felixstowe	6.73	1.00
Hamburg	.88	.75
Antwerp	.92	1.25
Felixstowe	.34	.83
LeHavre	.49	.75
Halifax	6.40	.625
New York	1.45	1.25
Baltimore	1.01	1.00
Halifax	2.19	-
	20.41	8.08
Delays	1.02	.81
Total Days	21.43	8.89

(Fixed Chgs)

		US$
Vessel Cost: 30.32 days - @ $20,760 per day		$ 629,443
Fuel: Int. 1500 21.43 days @ 50 tons = 1071.5 @ $144 =	154,296	
OMD 30.32 days @ 2.5 tons = 75.80 @ $235 =	17,813	172,109

PORTS OF CALL

	US$		
	Port Chgs	Container Handling Chgs	
Halifax	$ 12,672	64,971	
Felixstowe	25,959	92,223	
Hamburg	21,338	49,331	
Antwerp	25,625	47,014	
Felixstowe	25,959	78,036	
LeHavre	17,323	42,481	
Halifax	12,672	64,971	
New York	30,280	339,840	
Baltimore	30,390	184,000	
	$ 202,218	$ 962,867	= 1,165,085

ALLOCATIONS

Container Repair & Insurance	$ 80,862	
Positioning of Empty Containers	$ 80,000	
Sub Total	$ 160,682	160,682
TOTAL VOYAGE EXPENSES		$2,127,319

Total Boxes: 2,700 Total T.E.U.: 3,600

Unit Cost per box: US$787.90 Unit Cost per T.E.U.: $590.92

LIST OF SOURCES CONTACTED

Container Lines

Atlantic Container Line
Canada-Maritime
C.A.S.T.
Sealand Corporation
Barber Steamships

Shipowners & Shipmanagers

Bank Line - United Kingdom
Harrisons (Clyde) Ltd. - United Kingdom
Federal Commerce & Navigation - United Kingdom & Canada
Netumar Navigation - New York
Saguenay Shipping - United Kingdom

Ports

Port of Antwerp - Belgium
Port of Baltimore - U.S.A.
Port of Hamburg - New York
Port of Le Havre - France
Port of New Jersey & New York
Port of Montreal

Terminal Operators & Stevedores

Brunterm Ltd. - Saint John N.B.
Cerescorp Inc. - Halifax - Baltimore
International Terminal Operating Co., Inc. - New York
Eurokai Container Terminal - Hamburg
Havre Ocean Terminal - Le Havre - France
Noord Natie S.A. - Belgium
Racine Container Terminal - Montreal
Walton Container Terminal - Felixstowe - United Kingdom

List of Sources Contacted (contd')

Containers

C.T.I. Leasing
Hyundai Heavy Industries
Seacontainers Inc., New York

Other

General Council of British Shipping - U.K.
Ernst Glassel Gmb.H., Germany
Gellately Hankey (Belgium) N.V.
Furness Withy Agencies - United Kingdom
National Maritime Board - United Kingdom
Warren Container Agencies
Shipping Federation of Canada
Moran Towing & Transportation Co. Inc., N.Y.
MacAllister Brothers Inc.
Baltimore Docking Pilots Association
Association of Maryland Pilots
New York Sandy Hook Pilots
Cataneo Lines Service Inc.
Hyundai Heavy Industries (Shipbuilding)